PROJECT SPECIAL PROVISIONS

KING COUNTY, WA

SOUTH PARK BRIDGE #3179 REPLACEMENT

VOLUME 1 OF 3

DIVISIONS 1 THROUGH 7

King County CIP 300197

100% SUBMITTAL

(NOT FOR CONSTRUCTION)

KING COUNTY DEPARTMENT OF TRANSPORTATION

JANUARY 20, 2010

SOUTH PARK BRIDGE NO. 3179

(16th Avenue South over Duwamish Waterway)

Contract No. C00497C10
Project No. 300197

SPECIAL PROVISIONS

Table of Contents

INTRODUCTION 1

DESCRIPTION OF WORK 1

1-01 DEFINITIONS AND TERMS 2

1-01.3 DEFINITIONS 2

1-02 BID PROCEDURES AND CONDITIONS 3

1-02.1 PREQUALIFICATION OF BIDDER 3

1-02.4 EXAMINATION OF PLANS, SPECIFICATIONS AND SITE OF WORK 3

1-02.4(1) GENERAL 4

1-02.4(2) SUBSURFACE INFORMATION 4

1-02.4(3) REFERENCE DOCUMENTS (NEW SECTION) 4

1-02.5 PROPOSAL FORMS 5

1-02.6 PREPARATION OF PROPOSAL 5

1-02.8(3) CONFLICT OF INTEREST AND NON-COMPETITIVE PRACTICES (NEW SECTION 6

1-02.9 DELIVERY OF PROPOSAL/DATE OF OPENING BIDS 6

1-02.10 WITHDRAWAL OR REVISION OF PROPOSAL 6

1-02.13 IRREGULAR PROPOSALS 6

1-02.14 DISQUALIFICATION OF BIDDERS 7

1-02.15 PRE AWARD INFORMATION 14

1-03 AWARD AND EXECUTION OF CONTRACT 15

1-03.1 CONSIDERATION OF BIDS 15

1-03.1(1) ESCROW BID DOCUMENTATION (NEW SECTION) 17

1-03.2 AWARD OF CONTRACT 20

1-03.3 EXECUTION OF CONTRACT 21

1-03.3(1) REQUIRED SUBMITTALS PRIOR TO CONTRACT EXECUTION (NEW SECTION) 21

1-03.7 JUDICIAL REVIEW 22

1-04 SCOPE OF THE WORK 22

1-04.1 INTENT OF THE CONTRACT 22

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1-04.2 COORDINATION OF CONTRACT DOCUMENTS, PLANS, SPECIAL PROVISIONS, SPECIFICATIONS AND ADDENDA 23

1-05 CONTROL OF WORK 23

1-05.1 AUTHORITY OF THE ENGINEER 23
1-05.3 PLANS AND WORKING DRAWINGS 24
1-05.3(1) EQUIPMENT LISTS AND OTHER SUBMITTALS (NEW SECTION) 25
1-05.4 CONFORMITY WITH AND DEVIATIONS FROM PLANS AND STAKES 25
1-05.4(1) CONTRACTOR SURVEYING – ROADWAY (NEW SECTION) 25
1-05.4(2) CONTRACTOR SURVEYING – STRUCTURE (NEW SECTION) 29
1-05.5 RECORD DRAWINGS AND CONTRACT DOCUMENTS (NEW SECTION) 33
1-05.7 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK 33
1-05.12 FINAL ACCEPTANCE 34
1-05.13 SUPERINTENDENTS, LABOR AND EQUIPMENT OF CONTRACTOR 34
1-05.15 METHOD OF SERVING NOTICES 34

1-06 CONTROL OF MATERIAL 35

1-06.1 APPROVAL OF MATERIALS PRIOR TO USE 35
1-06.1(2) REQUEST FOR APPROVAL OF MATERIAL SOURCES (RAMS) 35
1-06.1(4) SHOP INSPECTION EXPENSE (NEW SECTION) 35
1-06.1(5) BUY AMERICA (NEW SECTION) 36
1-06.2(1) SAMPLES AND TESTS FOR ACCEPTANCE 37
1-06.3 MANUFACTURER'S CERTIFICATE OF COMPLIANCE 37

1-07 LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC 37

1-07.1(1) LEAD HEALTH PROTECTION PROGRAM (NEW SECTION) 37
1-07.2 STATE SALES TAXES 38
1-07.5(4)A FUGITIVE DUST (NEW SECTION) 38
1-07.5(5) ENVIRONMENTAL COMMITMENTS (NEW SECTION) 39
1-07.5(6) RECYCLED PAPER PRODUCTS (NEW SECTION) 39
1-07.5(7) CONCRETE GRINDING AND SAWCUTTING RESIDUE AND SLURRY (NEW SECTION) 40
1-07.6 PERMITS AND LICENSES 40
1-07.6(1) UNITED STATES COAST GUARD (NEW SECTION) 42
1-07.9 WAGES 43
1-07.9(1) GENERAL 43
1-07.10(1) EQUAL BENEFITS (NEW SECTION) 44

100% Submittal - Not for Construction

1-07.11(1)B NON-DISCRIMINATION AND EQUAL EMPLOYMENT OPPORTUNITY (EEO) (NEW SECTION) 44
1-07.11(1)A COMPLIANCE WITH SECTION 504 OF THE REHABILITATION ACT OF 1973, AS AMENDED AND THE AMERICAN WITH DISABILITIES ACT OF 1990 (NEW SECTION) 45
1-07.11(2)B FEDERAL REQUIREMENT FOR AFFIRMATIVE ACTION (NEW SECTION) 45
1-07.11(7) DISADVANTAGED BUSINESS ENTERPRISE CONDITION OF AWARD PARTICIPATION (NEW SECTION) 52
1-07.11(8) SPECIAL TRAINING PROVISIONS (NEW SECTION) 65
1-07.12(1) REQUIRED FEDERAL AID PROVISIONS (NEW SECTION) 70
1-07.13(1) GENERAL 70
1-07.14 RESPONSIBILITY FOR DAMAGE 70
1-07.15(1) SPILL PREVENTION, CONTROL AND COUNTERMEASURES PLAN 71
1-07.16 PROTECTION AND RESTORATION OF PROPERTY 73
1-07.16(1) PRIVATE/PUBLIC PROPERTY 73
1-07.16(1)A BUILDING CONDITION SURVEY (NEW SECTION) 74
1-07.16(4) ARCHAEOLOGICAL AND HISTORICAL OBJECTS 76
1-07.16(5) PAYMENT 77
1-07.17 UTILITIES AND SIMILAR FACILITIES 77
1-07.17(3) UTILITY CLEARANCES 78
1-07.17(3)A VACANT 78
1-07.17(3)B CLEARANCES BETWEEN STORM DRAIN AND OTHER UTILITIES (NEW SECTION) 78
1-07.17(3)C VACANT 79
1-07.17(3)D GAS MAIN CLEARANCES WITH HEAT GENERATING UTILITIES AND NON-HEAT GENERATING UTILITIES (NEW SECTION) 79
1-07.17(3)E TREE CLEARANCES (NEW SECTION) 79
1-07.17(3)F STANDARD LOCATION FOR UTILITIES – RESIDENTIAL STREET (NEW SECTION) 79
1-07.17(2) UTILITY CONSTRUCTION, REMOVAL OR RELOCATION BY OTHERS 79
1-07.18 PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE 80
1-07.23 PUBLIC CONVENIENCE AND SAFETY 85
1-07.23(1) CONSTRUCTION UNDER TRAFFIC 85
1-07.23(2)A PEDESTRIAN CONTROL AND PROTECTION (NEW SECTION) 86
1-08 PROSECUTION AND PROGRESS 88
1-08.1 SUBCONTRACTING 88
1-08.1(1) AFFIDAVITS OF AMOUNTS PAID (NEW SECTION 89

100% Submittal - Not for Construction

1-08.3(1) GENERAL REQUIREMENTS 89
1-08.3(2)B TYPE B PROGRESS SCHEDULE 90
1-08.3(2)D WEEKLY LOOK-AHEAD SCHEDULE 91
1-08.3(3) SCHEDULE UPDATES 92
1-08.3(5) PAYMENT 92
1-08.4 PROSECUTION OF WORK 92
1-08.4(1) ORDER OF WORK (NEW SECTION) 93
1-08.5 TIME FOR COMPLETION 94
1-08.9 LIQUIDATED DAMAGES 95
1-09 MEASUREMENT AND PAYMENT 96
1-09.3(1) STEEL COST ADJUSTMENT (NEW SECTION) 96
1-09.9 PAYMENTS 97
1-09.11(1)A DISPUTES REVIEW BOARD MEMBERSHIP 98
1-09.11(1)B DISPUTES REVIEW BOARD PROCEDURES 98
1-09.11(3) TIME LIMITATION AND JURISDICTION 98
1-10 TEMPORARY TRAFFIC CONTROL 99
1-10.1(2) DESCRIPTION 99
1-10.2(1) GENERAL 99
1-10.2(2) TRAFFIC CONTROL PLANS 99
1-10.3(3)A CONSTRUCTION SIGNS 100
1-10.3(3)L EXISTING SIGNING (NEW SECTION) 100
1-10.3(4) PAINT LINES AND LEGENDS (NEW SECTION) 100
1-10.4(2) ITEM BIDS WITH LUMP SUM FOR INCIDENTALS 101
2-01 CLEARING, GRUBBING, AND ROADSIDE CLEANUP 102
2-01.1 DESCRIPTION 102
2-02 REMOVAL OF STRUCTURES AND OBSTRUCTIONS 103
2-02.1 DESCRIPTION 103
2-02.3 CONSTRUCTION REQUIREMENTS 104
2-02.3(2) REMOVAL OF BRIDGES, BOX CULVERTS AND OTHER DRAINAGE STRUCTURES 106
2-02.3(2)A REMOVING EXISTING BRIDGE (NEW SECTION) 108
2-02.3(3) REMOVAL OF PAVEMENT, SIDEWALKS, AND CURBS 109
2-02.3(4) REMOVAL AND DISPOSAL OF HAZARDOUS MATERIALS (NEW SECTION) 110

100% Submittal - Not for Construction

2-02.3(5) REMOVAL OF APPROACH WALLS (NEW SECTION) 117
2-02.3(6) REMOVING PORTION OF EXISTING STRUCTURE – WHARF (NEW SECTION) 117
2-02.3(7) REMOVING PORTION OF EXISTING STRUCTURE – FENDER (NEW SECTION) 118
2-02.4 MEASUREMENT 119
2-02.5 PAYMENT 120
2-03 ROADWAY EXCAVATION AND EMBANKMENT 122
2-03.3(5) SLOPE TREATMENT 122
2-03.3(7)C CONTRACTOR-PROVIDED DISPOSAL SITE 122
2-03.3(19) POND EXCAVATION INCL. HAUL (NEW SECTION) 122
2-03.3(19)A GRADING FOR RAIN GARDEN (NEW SECTION) 122
2-03.3(19)B GRADING FOR EARTH BERM (EMBANKMENT COMPACTION) (NEW SECTION) 124
2-03.3(19)C MINERAL AGGREGATE TYPE 26 (FOR RAIN GARDEN (NEW SECTION) 124
2-03.3(20) SAND/GRAVEL BLANKET (NEW SECTION) 124
2-03.3(21) SHORELINE EXCAVATION INCL. HAUL (NEW SECTION) 125
2-03.4 MEASUREMENT 125
2-03.5 PAYMENT 126
2-04 HAUL 126
2-04.1 DESCRIPTION 126
2-04.4 MEASUREMENT 127
2-04.5 PAYMENT 127
2-09 STRUCTURE EXCAVATION 127
2-09.3(1)E BACKFILLING 127
2-12 CONSTRUCTION GEOSYNTHETIC 128
2-12.2 MATERIALS 128
2-12.3 CONSTRUCTION REQUIREMENTS 129
2-12.4 MEASUREMENT 129
2-12.5 PAYMENT 129
2-13 EARTHQUAKE DRAINS (NEW SECTION) 129
2-13.1 DESCRIPTION 129
2-13.1(1) GENERAL 129
2-13.1(2) REFERENCES 130

100% Submittal - Not for Construction

2-13.1(3) SUBMITTALS 130
2-13.3(4) PRECONSTRUCTION CONFERENCE 131
2-13.2 MATERIALS 131
2-13.2(1) PIPE 131
2-13.2(2) FILTER FABRIC 131
2-13.2(3) RESERVOIR STONE 131
2-13.3 CONSTRUCTION REQUIREMENTS 131
2-13.3(1) INSTALLATION 131
2-13.3(2) INSPECTION 133
2-13.3(3) ACCEPTANCE CRITERIA 133
2-13.3(4) DAILY LOGS 133
2-13.4 MEASUREMENT 133
2-13.5 PAYMENT 133
2-14 BRIDGE MONITORING (NEW SECTION) 134
2-14.1 DESCRIPTION 134
2-14.1(1) GENERAL 134
2-14.1(2) INSTRUMENTATION SPECIALIST 134
2-14-1(3) PROJECT CONDITIONS 134
2-14.1(4) DEFINITIONS 135
2-14.2 MATERIALS 135
2-14.2(1) GENERAL 135
2-14.2(2) TILT METERS 135
2-14.2(3) AUTOMATED MOTORIZED TOTAL STATION SYSTEM 135
2-14.2(4) VIBRATION MONITOR 136
2-14.2(5) DATA LOGGER 136
2-14.2(6) INSTRUMENT DATA MANAGEMENT SYSTEM 137
2-14.3 CONSTRUCTION REQUIREMENTS 137
2-14.3(1) GENERAL 137
2-14.3(2) INSTRUMENTATION INSTALLATION 137
2-14.3(3) CALIBRATION 138
2-14.3(4) INSTALLATION SCHEDULE 138
2-14.3(5) PROTECTION 139
2-14.3(6) MAINTENANCE 139
2-14.3(7) INSTRUMENT MONITORING 139
2-14.3(8) SUBMITTALS 140

100% Submittal - Not for Construction

2-14.4 MEASUREMENT 140
2-14.5 PAYMENT 140
5-04 HOT MIX ASPHALT 142
5-04.2 MATERIALS 142
5-04.3(3) HOT MIX ASPHALT PAVERS 142
5-04.3(11)A FEATHERING HOT MIX ASPHALT (NEW SECTION) 142
5-04.3(13) SURFACE SMOOTHNESS 142
5-04.3(14) PLANING BITUMINOUS PAVEMENT 143
5-04.3(22) HOT MIX ASPHALT FOR PRELEVELING (NEW SECTION) 143
5-05 CEMENT CONCRETE PAVEMENT 144
5-05.1 DESCRIPTION 144
5-05.3(8) JOINTS 144
5-05.3(8)A CONTRACTION JOINTS 144
5-05.3(8)B THROUGH JOINTS 146
5-05.3(8)C JOINT LOCATION 147
5-05.3(9) CASTINGS AND STEEL REINFORCING BARS IN CONCRETE PAVEMENT (NEW SECTION) 149
5-05.3(10)A DOWEL BARS (NEW SECTION) 149
5-05.3(10)B TIE BARS (NEW SECTION) 149
5-05.4 MEASUREMENT 150
5-05.5 PAYMENT 150
6-01 GENERAL REQUIREMENTS FOR STRUCTURES 151
6-01.5 WORK ACCESS AND TEMPORARY STRUCTURES (NEW SECTION) 151
6-01.9 WORKING DRAWINGS 153
6-01.10(A) UTILITIES ON BRIDGE (NEW SECTION) 153
6-01.11 NAME PLATES 157
6-02 CONCRETE STRUCTURES 158
6-02.2 MATERIALS 158
6-02.3 CONSTRUCTION REQUIREMENTS 159
6-02.3(1) CLASSIFICATION OF STRUCTURAL CONCRETE 159
6-02.3(2) PROPORTIONING MATERIALS 160
6-02.3(5)D TEST METHODS 160
6-02.3(6)E MASS CONCRETE (NEW SECTION) 160

100% Submittal - Not for Construction

6-02.3(6)F CLASS 4000HW CONCRETE (COUNTERWEIGHT CONCRETE) (NEW SECTION) 163
6-02.3(6)G CONCRETE CLASS 4000LW (LIGHTWEIGHT CONCRETE) (NEW SECTION) 164
6-02.3(6)H CONCRETE CLASS 4000WT (WATERTIGHT CONCRETE) (NEW SECTION) 166
6-02.3(7) CONCRETE EXPOSED TO SEA WATER 168
6-02.3(12) CONSTRUCTION JOINTS 168
6-02.3(13)A EXPANSION JOINT SYSTEM (NEW SECTION) 168
6-02.3(13)B COMPRESSION SEAL EXPANSION JOINT SYSTEM (NEW SECTION) 171
6-02.3(14)C PIGMENTED SEALER 171
6-02.3(19)A ELASTOMERIC BEARING PAD ASSEMBLIES (NEW SECTION) 171
6-02.3(19)C HIGH LOAD ELASTOMERIC BEARING PADS (NEW SECTION) 177
6-02.3(24) REINFORCEMENT 178
6-02.3(25)B CASTING 179
6-02.3(25)E CONTRACTORS CONTROL STRENGTH 179
6-02.3(25)M SHIPPING 179
6-02.3(29) EPOXY CRACK SEALING (NEW SECTION) 180
6-02.3(30) SUPERSTRUCTURE APPROACH SPANS (NEW SECTION) 181
6-02.4 MEASUREMENT 183
6-02.5 PAYMENT 186
6-03 STEEL STRUCTURES 187
6-03.3(7) SHOP PLANS 187
6-06 BRIDGE RAILINGS 188
6-06.1 DESCRIPTION 188
6-06.2 MATERIALS 188
6-06.3(3) METAL TRAFFIC BARRIER – BASCULE SPAN (NEW SECTION) 188
6-06.4 MEASUREMENT 188
6-06.5 PAYMENT 188
6-10 CONCRETE BARRIER 189
6-10.1 DESCRIPTION 189
6-10.3(2) CAST-IN-PLACE CONCRETE BARRIER WITH METAL RAILING 189
6-10.4 MEASUREMENT 189
6-10.5 PAYMENT 189

100% Submittal - Not for Construction

6-11 REINFORCED CONCRETE WALLS 189
6-11.3(6) TRAFFIC BARRIER AND PEDESTRIAN BARRIER 189
6-11.4 MEASUREMENT 190
6-11.5 PAYMENT 190
6-13 STRUCTURAL EARTH WALLS 190
6-13.1 DESCRIPTION 190
6-13.1(1) TWO-STAGE CONSTRUCTION FOR SEW (NEW SECTION) 190
6-13.2(1) WELDED WIRE FACED STRUCTURAL EARTH WALL MATERIALS (NEW SECTION) 191
6-13.3 CONSTRUCTION REQUIREMENTS 194
6-13.3(1)A RISK MANAGEMENT (NEW SECTION) 194
6-13.3(1)B INITIAL SETTLEMENT PERIOD (NEW SECTION) 195
6-13.3(1)C QUALITY ASSURANCE FOR FIRST STAGE WALLS (NEW SECTION) 196
6-13.3(1)D QUALITY ASSURANCE FOR SECOND STAGE WALLS (NEW SECTION) 196
6-13.3(1)E TWO STAGE WALL CONSTRUCTION EXPERIENCE (NEW SECTION) 196
6-13.3(2)A GEOTECHNICAL DESIGN PARAMETERS (NEW SECTION) 197
6-13.3(3) EXCAVATION AND FOUNDATION PREPARATION 197
6-13.3(10) SOIL REINFORCMENT (NEW SECTION) 197
6-13.3(11) FIRST STAGE WALL ERECTION - WIRE FACING (NEW SECTION) 198
6-13.3(12) RETAINED BACKFILL PLACEMENT - FIRST STAGE WALL (NEW SECTION) 198
6-13.3(13) SECOND STAGE WALL ERECTION - CONCRETE FACING PANELS (NEW SECTION) 200
6-13.4 MEASUREMENT 201
6-13.5 PAYMENT 201
6-19 SHAFTS (NEW SECTION) 201
6-19.1 DESCRIPTION 201
6-19.2 MATERIALS 201
6-19.2(1) CASING 201
6-19.2(2) REINFORCING STEEL 202
6-19.2(3) CONCRETE 202
6-19.2(4) SLURRY 202
6-19.2(5) ACCESS TUBES FOR CROSSHOLE SONIC LOG TESTING 205
6-19.2(6) GROUT 205
6-19.3 CONSTRUCTION REQUIREMENTS 205

100% Submittal - Not for Construction

6-19.3(1) QUALITY ASSURANCE 205
6-19.3(2) SUBMITTALS 206
6-19.3(3) SHAFT EXCAVATION 210
6-19.3(4) SLURRY INSTALLATION REQUIREMENTS 213
6-19.3(5) ASSEMBLY AND PLACEMENT OF REINFORCING STEEL 216
6-19.3(6) ACCESS TUBES FOR CROSSHOLE SONIC LOG TESTING 216
6-19.3(7) PLACING CONCRETE 217
6-19.3(8) CASING REMOVAL 218
6-19.3(9) NONDESTRUCTIVE TESTING OF SHAFTS (CROSSHOLE SONIC LOG TESTING) 219
6.19.4 MEASUREMENT 221
6.19.5 PAYMENT 222

6-20 SUPERSTRUCTURE - BASCULE SPAN (NEW SECTION) 224

6-20.1 DESCRIPTION 224
6-20.2 MATERIALS 224
6-20.3(1) PERMANENT STEEL BRIDGE DECK FORMS 225
6-20.3(2) COUNTERWEIGHTS 225
6-20.3(3) BASCULE SPAN CONSTRUCTION 225
6-20.3(4) FABRICATION 226
6-20.3(5) BASCULE SPAN ERECTION 226
6-20.3(6) PLACING SPAN IN OPERATION CONDITION 227
6-20.3(7) SPAN BALANCING 227
6-20.3(8) PAINTING 230
6-20.4 MEASUREMENT 230
6-20.5 PAYMENT 231

6-21 FENDER SYSTEM (NEW SECTION) 231

6-21.1 DESCRIPTION 231
6-21.1(1) SUBMITTALS 231
6-21.1(2) SHOP DRAWINGS 232
6-21.2 MATERIALS 232
6-21.3 CONSTRUCTION REQUIREMENTS 232
6-21.3(1) PLASTIC LUMBER INSTALLATION 232
6-21.3(2) PILING AND STEEL STRUCTURE INSTALLATIONS 233
6-21.3(3) FRP GRATING INSTALLATIONS 233
6-21.4 MEASUREMENT 233

100% Submittal - Not for Construction

6-21.5 PAYMENT 233
6-22 BASCULE PIER CAISSONS (NEW SECTION) 234
6-22.1 DESCRIPTION 234
6-22.1(1) CUTTING SHOE DESIGN 235
6-22.1(2) CAISSON COFFERDAM DESIGN 235
6-22.1(3) WORKING DRAWINGS AND COMPUTATIONS 236
6-22.2 MATERIALS 238
6-22.3 CONSTRUCTION REQUIREMENTS 238
6-22.3(1) CAISSON CONSTRUCTION 238
6-22.3(2) CAISSON OBSTRUCTIONS 241
6-22.3(3) SEAL CONSTRUCTION 241
6-22.3(4) USE OF EXPLOSIVES 242
6-22.3(5) CAISSON COFFERDAMS 242
6-22.3(6) SONAR INSPECTION 242
6-22.3(7) FINAL DIVER INSPECTION 244
6-22.3(8) SPECIAL EXCAVATION TESTING 244
6-22.3(9) ANCILLARY CAISSON ITEMS 244
6-22.4 MEASUREMENT 245
6-22.5 PAYMENT 246
6-23 FRP MAINTENANCE WALKWAYS (NEW SECTION) 248
6-23.1 DESCRIPTION 248
6-23.2 MATERIALS 248
6-23.2(1) DESIGN REQUIREMENTS 252
6-23.2(2) LOADS 252
6-23.2(3) DESIGN 253
6-23.2(3) DIMENSIONS 253
6-23.3 CONSTRUCTION REQUIREMENTS 253
6-23.4 MEASUREMENT 254
6-23.5 PAYMENT 254
6-24 BIRD CONTROL (NEW SECTION) 254
6-24.1 DESCRIPTION 254
6-24.2 MATERIALS 255
6-24.3 CONSTRUCTION REQUIREMENTS 255
6-24.3(1) SUBMITTALS 255

100% Submittal - Not for Construction

6-24.4 MEASUREMENT 255
6-24.5 PAYMENT 256
7-01 DRAINS 257
7-01.1 DESCRIPTION 257
7-01.2 MATERIALS 257
7-01.3 CONSTRUCTION REQUIREMENTS 257
7-01.3(2) UNDERDRAIN PIPE 258
7-01.3(3) JOINTS (NEW SECTION) 258
7-01.4 MEASUREMENT 258
7-02 CULVERTS 258
7-02.2 MATERIALS 258
7-02.3(6) DEBRIS BARRIER NEW SECTION 259
7-02.3(7) DEBRIS CAGE NEW SECTION 259
7-02.4 MEASUREMENT 259
7-02.5 PAYMENT 259
7-04 STORM SEWERS 260
7-04.1 DESCRIPTION 260
7-04.2 MATERIALS 260
7-04.3(1) CLEANING AND TESTING 260
7-04.4 MEASUREMENT 260
7-04.5 PAYMENT 261
7-05 MANHOLES, INLETS, CATCH BASINS AND DRYWELLS 261
7-05.1 DESCRIPTION 261
7-05.2 MATERIALS 261
7-05.3 CONSTRUCTION REQUIREMENTS 261
7-05.3(2) ABANDON EXISTING MANHOLES 262
7-05.3(3) CONNECTIONS TO EXISTING MANHOLES 262
7-05.3(3)A RECHANNEL EXISTING MANHOLE (NEW SECTION) 263
7-05.3(3)B REBUILD EXISTING MANHOLE (NEW SECTION) 263
7-05.3(5) MANHOLE (NEW SECTION) 264
7-05.3(6) CATCH BASINS AND INLETS (NEW SECTION) 270
7-05.4 MEASUREMENT 273
7-05.5 PAYMENT 273

100% Submittal - Not for Construction

7-06 PIPE ANCHOR, CEMENT CONC. ANCHOR, TRENCH DAMS, TIDE VALVES (NEW SECTION) 275
7-06.1 DESCRIPTION 275
7-06.2 MATERIALS 275
7-06.3 CONSTRUCTION REQUIREMENTS 275
7-06.4 MEASUREMENT 275
7-06.5 PAYMENT 275
7-07 CLEANING EXISTING DRAINAGE STRUCTURES 275
7-07.1 DESCRIPTION 275
7-07.3 CONSTRUCTION REQUIREMENTS 276
7-08 GENERAL PIPE INSTALLATION REQUIREMENTS 276
7-08.1 DESCRIPTION 276
7-08.2 MATERIALS 276
7-08.3(1)A TRENCHES 276
7-08.3(1)C BEDDING THE PIPE 276
7-08.3(1)D CONNECTIONS TO EXISTING SANITARY SEWERS (NEW SECTION) 277
7-08.3(1)E PIPE INSTALLING, JOINTING, AND TESTING (NEW SECTION) 277
7-08.3(1)F CATCH BASIN CONNECTIONS (NEW SECTION) 277
7-08.3(1)G INLET CONNECTIONS (NEW SECTION) 277
7-08.3(1)H DROP CONNECTIONS (NEW SECTION) 278
7-08.3(1)I VERTICAL CONNECTION (NEW SECTION) 278
7-08.3(4) PLUGGING EXISTING PIPE 278
7-08.3(4)A ABANDON AND FILL PIPE (NEW SECTION) 278
7-08.3(4)B PLUG PIPE (NEW SECTION) 279
7-08.3(5) CAPPING PIPE (NEW SECTION) 279
7-08.4 MEASUREMENT 279
7-13 FIRE PROTECTION WET HYDRANT SYSTEM (NEW SECTION) 280
7-13.1 DESCRIPTION 280
7-13.2 MATERIALS 281
7-13.3 CONSTRUCTION REQUIREMENTS 282
7-13.3(1) GENERAL 282
7-13.3(1) EXAMINATION 282
7-13.3(2) WELDING 282
7-13.3(3) SUPPORTS 283

100% Submittal - Not for Construction

7-13.3(4) HEATING CABLE INSTALLATION 283
7-13.3(5) HEAT TRACE EQUIPMENT GROUNDING 283
7-13.3(6) HEAT TRACE TESTING 283
7-13.4 MEASUREMENT 283
7-13.5 PAYMENT 283
7-15 SERVICE CONNECTIONS 284
7-15.1 DESCRIPTION 284
7-15.2 MATERIALS 284
7-15.3 CONSTRUCTION REQUIREMENTS 284
7-15.3(2) WATER LINE PIPE (NEW SECTION) 285
7-15.3(3) TEMPORARY WATER LINE (NEW SECTION) 285
7-15.3(4) AIR RELEASE VALVE ASSEMBLY (NEW SECTION) 285
7-15.3(5) PIPE INSULATION APPLICATION (NEW SECTION) 286
7-15.4 MEASUREMENT 288
7-15.5 PAYMENT 289
7-17 STORM DRAINS AND SANITARY SEWERS 290
7-17.1 DESCRIPTION 290
7-17.2 MATERIALS 290
7-17.2(1) TEMPORARY SCHEDULE A PIPE (SIZE) (NEW SECTION) 291
7-17.2(2) PROOF TESTS (PREQUALIFICATION) (NEW SECTION) 292
7-17.2(3) MATERIAL CERTIFICATION (NEW SECTION) 292
7-17.2(4) EXCAVATION AND PREPARATION OF TRENCH, PIPE BEDDING, AND CLAY DAM (NEW SECTION) 292
7-17.2(5) INSTALLING SEWER PIPE (NEW SECTION) 297
7-17.3(2)A GENERAL 302
7-17.3(2)B EXFILTRATION TEST 302
7-17.3(2)C INFILTRATION TEST 303
7-17.3(2)E AIR PRESSURE TEST FOR SEWERS CONSTRUCTED OF AIR-PERMEABLE MATERIALS (NEW SECTION) 303
7-17.3(2)F AIR PRESSURE TEST FOR PIPES CONSTRUCTED OF NON AIR-PERMEABLE MATERIALS 304
7-17.3(2)G DEFLECTION TEST FOR THERMOPLASTIC (FLEXIBLE) PIPE 308
7-17.3(2)H TELEVISION INSPECTION 309
7-17.3(3) BACKFILLING TRENCHES (NEW SECTION) 312
7-17.3(4) CLEANING AND TESTING (NEW SECTION) 314

100% Submittal - Not for Construction

7-17.4 MEASUREMENT 315
7-17.5 PAYMENT 316
7-19 SEWER CLEANOUT 319
7-19.1 DESCRIPTION 319
7-19.2 MATERIALS 320
7-19.3 CONSTRUCTION REQUIREMENTS 320
7-19.4 MEASUREMENT 320
7-19.5 PAYMENT 320
7-21 CONTROL HOUSE AND BASCULE PIER PLUMBING (NEW SECTION) 320
7-21.1 DESCRIPTION 320
7-21.1(1) CODE 321
7-21.1(2) SUBMITTALS 321
7-21.2 MATERIALS 321
7-21.2(1) PIPING AND FITTINGS 321
7-21.2(2) WATER VALVES 322
7-21.2(3) UNIONS 322
7-21.2(4) EXPANSION COMPENSATOR 322
7-21.2(5) BACKFLOW PREVENTION DEVICE 322
7-21.2(6) INSULATION AND HEAT TRACING 323
7-21.2(7) HOTWATER HEATER 323
7-21.2(8) SUMP PUMP 324
7-21.2(9) PIPE SUPPORTS 325
7-21.2(10) MISCELLANEOUS 325
7-21.3 CONSTRUCTION REQUIREMENTS 325
7-21.3(1) WARRANTY AND QUALITY CONTROL 325
7-21.3(2) INSTALLATION 325
7-21.3(3) TESTS AND DISINFECTION 326
7-21.4 MEASUREMENT 327
7-21.5 PAYMENT 327
7-22 SPECIAL SOIL MIX (LANDSCAPE BIORETENTION SOIL) (NEW SECTION) 327
7-22.1 DESCRIPTION 327
7-22.2 MATERIALS 327
7-22.3 CONSTRUCTION REQUIREMENTS 327
7-22.3(1) GENERAL 327

100% Submittal - Not for Construction

7-22.3(2) SUBMITTALS 328
7-22.3(3) BIORETENTION SOIL CONSTRUCTION 328
7-22.4 MEASUREMENT 329
7-22.5 PAYMENT 329

100% Submittal - Not for Construction

King County

SPECIAL PROVISIONS

SOUTH PARK BRIDGE NO. 3179 REPLACEMENT

(16th Avenue south over Duwamish Waterway)

Contract No. C00497C10
Project No. 300197
Fed. Aid No. _____

GENERAL REQUIREMENTS

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INTRODUCTION

The following Special Provisions in conjunction with the 2008 *Standard Specifications for Road, Bridge and Municipal Construction*, issued by the Washington State Department of Transportation and the American Public Works Association, Washington State Chapter (Standard Specifications), and the 2007 King County *Road Design and Construction Standards* (KCRDCS), which were adopted by the King County Council, govern this Contract. These Special Provisions supersede the referenced portions of Standard Specifications. Where any provision of Standard Specifications is modified or deleted by these Special Provisions, the unaltered, remaining portions remain in full force and effect.

Copies of the Standard Specifications and KCRDCS are on file in the office of the County Road Engineer, Department of Transportation, Road Services Division, 2nd Floor, 201 South Jackson Street, Seattle, Washington, 98104-3856 where they may be examined

Wherever reference is made in the Standard Specifications to the Secretary of Transportation or Engineer, such reference shall be construed to mean the King County Road Engineer or the County Road Engineer's duly authorized assistants.

Wherever reference is made to the "State Materials Lab" in the Standard Specifications such reference shall be revised to read "King County Materials Lab (Renton, WA.)".

DESCRIPTION OF WORK

This project provides for the replacement of South Park Bridge over the Duwamish Waterway in King County by constructing a new drawbridge downriver and parallel to the existing South Park Bridge, intersection improvements, roadway, drainage, and utility construction, approach spans and retaining wall construction, riverbank mitigation, incorporation of historic and art elements, illumination, demolition of existing bridge, and other work, all in accordance with the attached

Plans, these Special Provisions, the Standard Specifications, the KCRDCS, and the APWA/WSDOT Standard Plans for Road, Bridge, and Municipal Construction.

1-01 DEFINITIONS AND TERMS

1-01.3 DEFINITIONS

The definition for "Contracting Agency" is deleted and replaced with the following:

Contracting Agency

Agency of Government that is responsible for the execution and administration of the contract. Also means King County, Department of Transportation, Roads Services Division.

The definition for "Engineer" is deleted and replaced with the following:

Engineer

The Contracting Agency's representative who administers the construction program for the Contracting Agency. Also means King County Road Engineer or the King County Road Engineer's authorized assistants.

The following definitions are added to this section:

Agreement

For the purposes of this Contract, the term "Agreement" means Contract.

Change Order

A document required by the Engineer which authorizes an addition, deletion, or revision in the Work, or an adjustment in the Contract Price or the Contract Time, issued after the execution of the Contract.

Contract Documents

The term "Contract Documents" shall have the same meaning as Contract.

County

King County, Department of Transportation, Road Division (KCDOT).

Notice to Proceed

The written notice by the County to the Contractor fixing the date on which the Contract Time will commence to run and on which Contractor shall start to perform Contractor's obligations under the Contract Documents.

Performance and Payment Bond

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The definition is the same as that provided for the term "Contract Bond." The Contractor will be required to submit a performance and payment bond, in quadruplicate, on the County provided form within 10 days of receipt of Notice of Selection.

COS

The term "COS" shall mean the 2008 City of Seattle Standard Specifications for Road, Bridge and Municipal Construction.

COSP

The term "COSP" shall mean the City of Seattle Standard Plans for Municipal Construction, 2008 Edition.

1-02 BID PROCEDURES AND CONDITIONS

1-02.1 PREQUALIFICATION OF BIDDER

This section is deleted in its entirety and replaced with the following:

1-02.1 QUALIFICATIONS OF BIDDER

Bidders must meet the minimum qualifications of RCW 39.04.350(1), as amended:

"Before award of a public works contract, a bidder must meet the following responsibility criteria to be considered a responsible bidder and qualified to be awarded a public works project. The bidder must:

a) At the time of bid submittal, have a certificate of registration in compliance with chapter 18.27 RCW;

b) Have a current state unified business identifier number;

c) If applicable, have industrial insurance coverage for the bidder's employees working in Washington as required in Title 51 RCW; an employment security department number as required in Title 50 RCW; and a state excise tax registration number as required in Title 82 RCW; and

d) Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065(3)."

Bidders shall be qualified by experience, financing, equipment, and organization to do the work called for in the Contract Documents. King County reserves the right to take whatever action it deems necessary to ascertain the ability of the Bidders to perform the work satisfactorily.

1-02.4 EXAMINATION OF PLANS, SPECIFICATIONS AND SITE OF WORK

The following is added to this section:

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The "PHASE II ENVIRONMENTAL SITE ASSESSMENT REPORT, South Park Bridge Replacement Project Seattle, Washington - September 2009" will be provided on the Builders Exchange of Washington website through an external link from http://www.kingcounty.gov/procurement.aspx.

1-02.4(1) GENERAL

The following is added at the end of this section:

Prior to bid opening if a Bidder discovers any provision in the Plans, Specifications, or Contract which is contrary to or inconsistent with any law or regulation, such Bidder shall immediately report this discovery in writing to the Contract Specialist identified in the Invitation to Bid.

After Contract Execution, if the Contractor discovers any provision in the Plans, Specifications, or Contract which is contrary to or inconsistent with any law or regulation, such Contractor shall immediately report this discovery in writing to the Engineer.

1-02.4(2) SUBSURFACE INFORMATION

The following is added at the end of this section:

In reference to this section, the soils information used for study and design of this project will be provided on the Builders Exchange of Washington website through an external link from http://www.kingcounty.gov/procurement.aspx, however these documents shall not be considered as part of the Contract.

1-02.4(3) REFERENCE DOCUMENTS (NEW SECTION)

The following Reference Documents are available for inspection by the Bidders:

a. South Park Bridge Replacement Project, Phase I Environmental Site Assessment Report, Seattle, Washington - August 2009

b. South Park Bridge Replacement Project, Phase II Environmental Site Assessment Report, Seattle, Washington - September 2009

c. South Park Bridge Plans and Specifications (circa 1929)

d. South Park Bridge, Bridge Span resurfacing (circa 1950)

e. Partial 14th Avenue Bridge Plans and Specifications (circa 1916)

f. Partial Boeing Wharf Plans (circa 1952)

g. South Park Bridge Project, Geotechnical Report, Phase II (March 29, 2004)

h. South Park Bridge Project, Supplemental Geotechnical Data Report (April 6, 2009)

100% Submittal - Not for Construction

i. South Park Bridge Project, Supplemental Geotechnical Report, Final Design (July 17, 2009)

j. Agreement Relating to South Park Bridge between The Boeing Company and King County.

k. Limited Hazardous Building Material Survey, South Park Bridge, Seattle, Washington – November 30, 2009.

l. Technical Memorandum, South Park Bridge ESA Support, September 2, 2007,

m. Hazardous Material Data Summary Report, South Park Bridge Replacement Project, Seattle, Washington, May 15, 2008,

n. Soil Borings SB4 and SB5 Data Summary Report, South Park Bridge Replacement Project, Seattle, Washington, November 12, 2008

o. Analysis of Hydraulic Effects and Riverbed Scour, South Park Bridge Replacement Project, King County, Washington, November 2007

These Reference Documents will be provided on the Builders Exchange of Washington website through an external link from http://www.kingcounty.gov/procurement.aspx, however these documents shall not be considered as part of the Contract. King County makes no representation or warranty expressed or implied that:

- The Bidders' interpretations of the documents is correct;
- Locations of features or conditions indicated in the documents are correct; or
- The features or conditions indicated in the documents have not been altered or removed.

King County makes no representations, guarantees, or warranties as to the accuracy of the documents. The availability of historic project documents from King County shall not relieve the Bidder or the Contractor from any risks or of any duty to make examinations and investigations as required by Section 1-02.4(1) or any other responsibility under the Contract or as may be required by law.

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1-02.5 PROPOSAL FORMS

The following is added at the end of this section:

The proposal invites bids on definite Plans and Specifications. Only the amounts and information asked for on the proposal form furnished will be considered as the bid. Each bidder shall bid upon the work exactly as specified and as provided on the Proposal Form.

1-02.6 PREPARATION OF PROPOSAL

The following is added at the end of this section:

If the Contract provisions establish a minimum bid amount for the item "Plant Establishment", the bid for the item in the Proposal Form shall equal or exceed that amount. If the Contractor's bid is less than the minimum specified amount, the County will unilaterally revise the bid amount to the minimum specified amount and recalculate the Contractor's total bid amount. The corrected total bid amount will be used by the County for award purposes and to fix the amount of the Contract Bond.

The following forms shall be submitted with the Proposal, which are made a part of the Bidder's formal bid proposal:

- DBE Utilization Certification
- Non-Collusion Declaration
- Certification for Federal-Aid Contracts

The County shall consider as non-responsive and shall reject any bid proposal submitted that does not contain the forms identified in this Specification.

1-02.8(3) CONFLICT OF INTEREST AND NON-COMPETITIVE PRACTICES (NEW SECTION

The Contractor shall comply with Chapter 3.04 of the King County Code, pertaining to conflicts of interest, and contingent fees and gratuities. Section 3.04.060 of the King County Code authorizes criminal liability, and civil penalties, including the cancellation of current contracts and disqualification from bidding for a two-year period, for any person who violates Section 3.04.060 of the King County Code.

1-02.9 DELIVERY OF PROPOSAL/DATE OF OPENING BIDS

The first paragraph is deleted and replaced with the following:

Sealed bids will be received at King County Procurement and Contract Services Section, Chinook Building, 401 Fifth Avenue, 3rd Floor, Seattle, Washington 98104 until 1:30 p.m., March 11, 2010, and then and there publicly opened and read aloud.

1-02.10 WITHDRAWAL OR REVISION OF PROPOSAL

The following is added at the end of this section:

No oral, electronic, or telephonic proposals or modifications will be considered.

1-02.13 IRREGULAR PROPOSALS

Item 1 is deleted and replaced with the following:

1. A proposal will be considered irregular and will be rejected if:
   a. The Bidder is not prequalified, when so required;
   b. The authorized Proposal Form furnished by the Contracting Agency is not used or is altered;

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c. The completed Proposal Form contains any unauthorized additions, -deletions, alternate bids, or conditions;

d. The Bidder adds provisions reserving the right to reject or accept the award, or enter into the contract;

e. A price per unit cannot be determined from the bid proposal;

f. The proposal form is not properly executed;

g. The Bidder fails to submit or properly complete a subcontractor list, if applicable, as required in Section 1 02.6.

h. The Bidder fails to submit or properly complete a Disadvantaged, Minority or Women's Business Enterprise Certification, if applicable, as required in Section 1-02.6; or

i. The bid proposal does not constitute a definite and unqualified offer to meet the material terms of the bid invitation; or

j. More than one proposal is submitted for the same project from a Bidder under the same or different names.

1-02.14 DISQUALIFICATION OF BIDDERS

This section is deleted in its entirety and replaced with the following:

A Bidder will be deemed not responsible if:

1. The Bidder does not meet the mandatory bidder responsibility criteria in RCW 39.04.350(1), as amended; or

2. Evidence of collusion exists with any other Bidder or potential Bidder. Participants in collusion will be restricted from submitting further bids; or

3. The Bidder, in the opinion of the Contracting Agency, is not qualified for the work or to the full extent of the bid, or to the extent that the bid exceeds the authorized prequalification amount as may have been determined by a prequalification of the Bidder; or

4. An unsatisfactory performance record exists based on past or current Contracting Agency work or for work done for others, as judged from the standpoint of conduct of the work; workmanship; or progress; affirmative action; equal employment opportunity practices; termination for cause; or Disadvantaged Business Enterprise, Minority Business Enterprise, or Women's Business Enterprise utilization; or

5. There is uncompleted work (Contracting Agency or otherwise), which in the opinion of the Contracting Agency might hinder or prevent the prompt completion of the work bid upon; or

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6. The Bidder failed to settle bills for labor or materials on past or current contracts, unless there are extenuating circumstances acceptable to the Contracting Agency; or

7. The Bidder has failed to complete a written public contract or has been convicted of a crime arising from a previous public contract, unless there are extenuating circumstances acceptable to the Contracting Agency; or

8. The Bidder is unable, financially or otherwise, to perform the work, in the opinion of the Contracting Agency; or

9. There is any other reasons deemed proper by the Contracting Agency.

In addition to the above, the Bidder's team shall demonstrate that the Bidder's team and the Project Manager and Superintendant(s) proposed to work on this project have successfully completed projects of a similar size and scope as required by the Contract Documents for this project. For the purposes of meeting this criterion, the County has determined that "similar size and scope to this project" means projects that have the following characteristics: construction of a moveable bridge using bascule machinery, control rooms with similar equipment as used on this project, caisson installation, building condition surveys, hazardous materials handling and disposal, drilled shafts, and working in an urban environment (able to work with minimal disruption to businesses and the traveling public).

1. Work Performed by Bidder

   A. The Bidder shall demonstrate how, with its own forces, it shall perform work equivalent to at least 30% of the Contract Price. The Bidder may demonstrate this by identifying the work using the specification divisions (Divisions 1 through 11) or sections within a division it intends to perform with its own forces and the estimated dollar amount and percentage to its overall bid amount this itemized work constitutes.

2. Bidder's Experience

   A. General Contractor: The Bidder shall demonstrate successful past experience and competence in managing no less than 2 construction projects within the last 10 years that meet the Similar in Scope and Complexity elements. To qualify as a project, the Owner must have determined the project to be substantially complete or issued final acceptance.

      1. The Bidder shall demonstrate successful past experience and competence in managing no less than 2 construction projects within the last 10 years that meet the Similar in Scope and Complexity elements. To qualify as a project, the Owner must have determined the project to be substantially complete or issued final acceptance.

         a. Projects for which the Bidder was a subcontractor are not eligible under these criteria.

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b. For this requirement, the term Bidder includes: (i) the legal entity that signed this bid; or (ii) any member of the Joint Venture (JV) or Business Organization Structure (BOS) provided the member was responsible for managing the day-to-day administrative activities for the referenced projects and is responsible for management of day-to-day activities of this contract.

2. For each project, identify the name of the project, describe the project and how it meets each Similar in Scope and Complexity element, initial contract time (start and end dates), final contract time (actual end date), initial contract value, final contract value, name and phone number of the Owner, and name and telephone number of the Owner's project manager or other person who can verify the Bidder's experience.

3. If the Bidder is a JV or BOS, provide information for the members of the JV or BOS who will be managing the day-to-day administrative activities for this Contract. Administrative activities involve the contract administration activities contained in Division 0 and Division 1. If a JV/BOS partner is only providing financial support for this Contract, this information is not required and will not be evaluated with regard to this element.

B. Caisson Construction: The Bidder shall demonstrate that the firm(s) responsible for performing the caisson work has successful past experience on no less than 2 construction projects within the last 10 years constructing caissons of similar size and complexity as that required for this project. To qualify as a project, the Owner must have determined the project to be substantially complete or issued final acceptance.

1. Identify all contracts within the past 10 years in which the firm(s) performed caisson construction.

2. For each project, identify the name of the project, describe the project, explain how the project meets or exceeds the characteristics defined above, name and phone number of the Owner, name and phone number of the general contractor, and name and telephone number of the Owner's project manager or other person who can verify the experience of the firm.

3. If the firm responsible for performing the work is a JV and BOS, the County will consider the experience the JV or BOS member provided the member is performing the caisson work. If a JV or BOS partner is only providing financial support for this Contract, this information is not required and will not be evaluated with regard to this element.

C. Bridge Demolition: The Bidder shall demonstrate that the firm(s) responsible for performing the bridge demolition work has successful past experience on

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no less than 2 construction projects within the last 10 years demolishing a bridge of similar size and complexity, in environmentally sensitive areas, as that required for this project. To qualify as a project, the Owner must have determined the project to be substantially complete or issued final acceptance.

1. Identify all contracts within the past 10 years in which the firm(s) performed bridge demolition similar in size and scope of work required for this project.

2. For each project, identify the name of the project, describe the project, explain how the project meets or exceeds the characteristics defined above, name and phone number of the Owner, name and phone number of the general contractor, and name and telephone number of the Owner's project manager or other person who can verify the experience of the firm.

3. If the firm responsible for performing the work is a JV and BOS, the County will consider the experience the JV or BOS member provided the member is performing the bridge demolition work. If a JV or BOS partner is only providing financial support for this Contract, this information is not required and will not be evaluated with regard to this element.

D. Identify for the past 5 years any construction contracts in which the Bidder's surety has taken over all or a portion of the project to cure or respond to an asserted default or material breach on the part of the Bidder (a "Bond Forfeiture"). If the Bidder is a JV or BOS, provide such information for every partner of the JV or BOS. If a Bidder has been involved in a Bond Forfeiture in the past five years, the Bidder shall be deemed not responsible. If any partner of the JV or BOS has been involved in a Bond Forfeiture in the past five years, the JV or BOS shall be deemed not responsible.

E. If the Bidder is a JV or BOS, the Bidder shall submit the additional following information:

1. A copy of the Joint Venture Agreement and any related documents; or a copy of the agreement establishing the relationship of the parties and any related documents;

2. Description of the business relationship between the parties;

3. Description of the specific roles and responsibilities each member of the JV will have in relation to this Contract; and,

4. List of past projects where the partners of the JV worked together in the past and indicate the roles and responsibilities of each member in relation to that project.

3. <u>Project Team Members</u>

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A. The Bidder shall demonstrate that the individuals making up the project team have successful past experience for each of the elements identified herein. The experience, technical competence, and qualifications of each project team member will be reviewed and evaluated. By identifying the project team members in the qualification information, the Bidder is committing to making the individuals available and responsible for the day-to-day management, supervision, and/or performance of the tasks identified.

B. Organizational Chart

1. Provide an organizational chart identifying the project team members and any other position the Bidder deems essential to demonstrate the organizational structure.

2. Project team members shall include:

   a. Project Manager;

   B... Project Superintendent;

   c. Supervisor in charge of managing the caisson construction

3. Provide a description of each individuals past experience.

4. Identify the percentage of time each person is allocated to this Project for the particular task.

C. Project Manager

1. Identify the Project Manager

2. The Project Manager shall have successful past experience and competence in managing the day-to-day activities on no less than 2 construction projects within the last 10 years that meet the Similar in Scope and Complexity elements. To qualify as a project, the Owner must have determined the project to be substantially complete or issued final acceptance.

3. Identify all projects in the last 10 years managed by this individual that meet the Similar in Scope and Complexity elements or describe requirement and describe in detail this team member's responsibility on the project. For each project, identify the name of the project, describe the project, explain how the project meets or exceeds the definition of Similar in Scope and Complexity elements or describe requirement, initial contract time (start and end dates), final contract time (actual end date), initial contract value, final contract value, name and phone number of the Owner,

10/06 Submittal - Not for Construction

and name and telephone number of the Owner's project manager or other person who can verify the experience of the individual.

D. Project Superintendent

1. Identify the Project Superintendent

2. The Project Superintendent shall have successful past experience and competence performing such duties on no less than 2 construction projects within the last 10 years that meet the Similar in Scope and Complexity elements. To qualify as a project, the Owner must have determined the project to be substantially complete or issued final acceptance.

3. Identify all projects in the last 10 years that meet the Similar in Scope and Complexity elements and describe in detail this team member's responsibility on the project. For each project, identify the name of the project, describe the project, explain how the project meets or exceeds the definition of Similar in Scope and Complexity, initial contract time (start and end dates), final contract time (actual end date), initial contract value, final contract value, name and phone number of the Owner, name and phone number of the Contractor, and name and telephone number of the Owner's project manager or other person who can verify the experience of the individual.

E. Person responsible for managing the caisson construction (Caisson Supervisor).

1. Identify the Caisson Supervisor.

2. The Caisson Supervisor shall have successful past experience and competence managing the construction of caissons similar in size and complexity to the work required for this project. To qualify as a project, the Owner must have determined the project to be substantially complete or issued final acceptance.

3. Identify all projects in the last 10 years that the Caisson Supervisor managed caisson construction. For each project, identify the name of the project, describe the project, explain how the caisson construction meets or exceeds the caisson construction requirements for this project, name and phone number of the Owner, and name and telephone number of the Owner's project manager or other person who can verify the experience of the individual.

4. Contract History

10096 Submittal - Not for Construction

A. The County will evaluate to determine if the Bidder's contract history demonstrates quality of past performance and the capability to successfully manage and construct this Project.

B. Identify if within the past 5 years that the Bidder or, if the Bidder is a JV or BOS, any member of the JV or BOS has:

1. Had a contract terminated for cause or default;

2. Has been (a) convicted of a willful violation or (b) issued a willful violation citation by Department of Labor & Industries, or similar organization with jurisdiction in the United States;

3. Not been an active contractor;

4. Been in bankruptcy, reorganization and/or receivership;

5. Not been registered and licensed as a construction contractor;

6. Been disqualified by any federal, state or local agency from being awarded and/or participating in public contracts.

C. Explain the circumstances surrounding the event identified above.

5. Criminal History

A. The County will evaluate to determine if the Bidder's criminal history demonstrates inappropriate character, integrity, reputation, judgment, and experience of the Bidder. Identify all criminal convictions, including pleas of nolo contendere, of the Bidder and any officers of the Bidder. If the Bidder is a JV or BOS, provide all information for each member of the JV or BOS.

6. Accident/Injury Experience

A. Submit the Bidder's accident/injury experience factor from the Department of Labor and Industries or other appropriate organization for the past five (5) years. If the Bidder is a joint venture, provide information for members of the joint venture who will be performing and managing the Contract work. If a JV or BOS partner is only providing financial support, this information is not required and will not be evaluated with regard to this element.

B. Bidders that have an experience modification factor over 1.0 may be required to provide additional written information regarding Bidder's safety history to assess bidder's responsibility to perform the work for this project.

7. Additional Information

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A. At the County's request, provide any additional explanation or information, which would assist in evaluating the qualifications of the Bidder, subcontractors, project team members, JV or BOS members, and bid price

As evidence that the Bidder meets the responsibility criteria above, the apparent two lowest Bidders must submit to the Contract Specialist within 3 business days of the bid submittal deadline, documentation (sufficient in the sole judgment of the Contracting Agency) demonstrating compliance with all applicable responsibility criteria, including all documentation specifically listed in the supplemental criteria. The Contracting Agency reserves the right to request such documentation from other Bidders as well, and to request further documentation as needed to assess bidder responsibility.

The basis for evaluation of Bidder compliance with these supplemental criteria shall be any documents or facts obtained by Contracting Agency (whether from the Bidder or third parties) which any reasonable owner would rely on for determining such compliance, including but not limited to: (i) financial, historical, or operational data from the Bidder; (ii) information obtained directly by the Contracting Agency from owners for whom the Bidder has worked, or other public agencies or private enterprises; and (iii) any additional information obtained by the Contracting Agency which is believed to be relevant to the matter.

If the Contracting Agency determines the Bidder does not meet the bidder responsibility criteria above and is therefore not a responsible Bidder, the Contracting Agency shall notify the Bidder in writing, with the reasons for its determination. If the Bidder disagrees with this determination, it may appeal the determination within 24 hours of receipt of the Contracting Agency's determination by presenting its appeal to the Contracting Agency. The Contracting Agency will consider the appeal before issuing its final determination. If the final determination affirms that the Bidder is not responsible, the Contracting Agency will not execute a contract with any other Bidder until at least two business days after the Bidder determined to be not responsible has received the final determination.

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1-02.15 PRE AWARD INFORMATION

This section is deleted in its entirety and replaced with the following:

Before awarding any contract, the Contracting Agency may require one or more of these items or actions of the apparent lowest responsible bidder:

1. A complete statement of the origin, composition, and manufacture of any or all materials to be used,
2. Samples of these materials for quality and fitness tests,
3. A progress schedule (in a form the Contracting Agency requires) showing the order of and time required for the various phases of the work,
4. A breakdown of costs assigned to any bid item,
5. Attendance at a conference with the Engineer or representatives of the Engineer,

6. Obtain, and furnish a copy of, a business license to do business in the city or county where the work is located.

7. A copy of State of Washington Contractor's Registration, or

8. Any other information or action taken that is deemed necessary to ensure that the bidder is the lowest responsible bidder.

1-03 AWARD AND EXECUTION OF CONTRACT

1-03.1 CONSIDERATION OF BIDS

The following is added at the end of this section:

Form of Protest. In order to be considered, a Protest shall be in writing, addressed to the Manager of the King County Procurement and Contract Services of the Department of Executive Services (Manager). A copy of the Protest shall be provided to the Contract Specialist identified in the Invitation to Bid. The Protest shall include the following:

1. The name, address, and phone number of the Bidder protesting, or the authorized representative of the Bidder;

2. The Solicitation Number and Title under which the Protest is submitted;

3. A detailed description of the specific grounds for Protest and any supporting documentation. It is the responsibility of the Protesting Bidder to supplement its Protest with any subsequently discovered documents prior to the Manager's decision;

4. The specific ruling or relief requested; and

5. Evidence that all persons with a financial interest in the procurement have been given notice of the Protest or if such persons are unknown, a statement to that effect.

Who May Protest.

1. *Protests based on specifications*: Any prospective Bidder.

2. *Protests following Bid opening*: Any Bidder who submitted a bid and can demonstrate a substantial financial interest in award of a Contract.

Time to Protest. Protests challenging the specifications or the supplemental bidder responsibility criteria must be received by the County no later than ten (10) calendar days prior to the date established for submittal of Bids; provided however, if the tenth calendar day is a weekend or County holiday, the Protest must be received by noon the following business day.

In accordance with RCW 39.04.350(d), a Bidder's right to appeal a determination that the Bidder is not responsible shall be considered a "protest" and filed within five (5) calendar days of

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receipt of the rejection letter; provided however, if the fifth calendar day is a weekend or County holiday, the Protest must be received by noon the following business day.

The County must receive protests based on all other circumstances within five (5) calendar days after the protesting Bidder knows or should have known of the facts and circumstances upon which the Protest is based; provided however, if the fifth calendar day is a weekend or County holiday, the Protest must be received by noon the following business day.

In no event shall a Protest be considered if all bids are rejected or after execution of the Contract.

Determination of Protest. Upon receipt of a timely written Protest, the Manager shall investigate the Protest and shall respond in writing to the Protest prior contract execution. Except as provided below, the decision of the Manager shall be final.

Reconsideration of Manager's Decision. A financially interested Bidder may request that a Manager's adverse decision be reviewed by the Finance and Business Operations Division Director of the King County Department of Executive Services ("Finance Director") on a reconsideration basis only. The only justification for reconsideration is the Manager made an error of law or regulation. The following procedures shall be followed for a reconsideration of the Manager's decision:

1. Form of Request for Reconsideration. In order to be considered, a Request for Reconsideration must be filed with the Finance Director in writing, with a copy provided to the Contract Specialist, and include:

    a. Name, address, and telephone number of the person protesting or their authorized representative;

    b. A copy of the written decision of the Manager; and

    c. Include all pertinent facts and law on which the Bidder is relying.

2. Time for Filing Request for Reconsideration. The financially interested Bidder must file the Request for Reconsideration no later than two (2) business days after receiving the Manager's decision.

3. Review of Manager's Decision. Upon receipt of a Request for Reconsideration, the Finance Director or his/her designee shall review (1) the information submitted to and reviewed by the Manager and (2) the decision of the Manager and shall thereafter issue a final determination in writing regarding the Request for Reconsideration..

4. Contract Execution: If a timely Request for Reconsideration is filed, the County will not execute a contract any sooner than two (2) business days after issuance of the final determination regarding the Request for Reconsideration.

Failure to Comply. Failure to comply with the procedures set forth herein may render a Protest untimely or inadequate and may result in rejection thereof by the County.

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Exhaustion of Administrative Remedies: As a mandatory condition precedent to initiating a lawsuit against the County, a Bidder shall comply with the Protest and Reconsideration Procedures defined herein.

Venue: By submitting a bid in response to the Invitation to Bid and for the convenience of the parties, the Bidder acknowledges and agrees that a lawsuit or action related to or arising out of this procurement shall be brought in the Superior Court of King County, Washington.

1-03.1(1) ESCROW BID DOCUMENTATION (NEW SECTION)

This specification specifies the submittal, use, and preservation of Bidder's (Contractor's and subcontractor's) Escrow Bid Documentation, as defined herein (hereinafter also referred to as "Bid Documentation", "Bid Document" or "Documents"). The Bid Documents provided by the Bidders(s) shall be specific enough that a third person could look at the Bid Documents and determine the labor, material, construction equipment, tools, incidentals, permanent equipment costs, and field and home office overhead and profit for each individual bid item in the Contract Proposal. The apparent low bidder shall execute the enclosed Escrow Bid Documentation Instruction Agreement and submit no later than the meeting to review the Bid Documents as set forth in the subtitle "Delivery of Bid Documentation to the County".

Bidder Responsibilities: The apparent low Bidder and second low Bidder shall submit a legible copy of any and all Escrow Bid Documentation used to prepare the bid for this Contract no later than the time specified in the subtitle "Delivery of Bid Documentation to the County".

The County may also request Bid Documentation from any other Bidder and such Bid Documentation shall be provided to the County within two (2) business days of such request.

Escrow Bid Documentation Definition: The terms "Escrow Bid Documentation", "Bid Documentation" and "Bid Documents" as used in this Special Provision include but are not limited to the following documents:

1. Quotes from subcontractors, suppliers, subconsultants, and materialmen with any and all backup documentation;
2. Takeoff sheets, cut and add sheets, and any and all backup documentation;
3. Any and all writings, drafts, working papers, take off sheets, phone logs, computer printouts, charts, electronic data, spreadsheets, drawings, scope of work narratives or outlines, photographs, and any other documentation or data compilations which contain or reflect any and all information, data, and calculations compiled to, referred to, related to, and/or used to:
    a. estimate and/or prepare the bid;
    b. estimate productivity, types of equipment and materials, and manpower; and

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c. estimate, determine, evaluate, and/or compare equipment rates, labor rates, efficiency or productivity factors, and overhead and profit rates.

4. Any and all survey notes or calculations, and/or site visit notes or documents; and

5. Any and all manuals, books, and/or reference guides which were used in determining the bid for this Contract. If such manuals, books, and/or reference guides are standard in the industry, they may be included in the Bid Documentation by reference provided the reference includes the title, edition, publication date, and author. At the request of the County, the Bidder shall provide a copy of the manuals, books, and reference guides at no cost to the County.

6. Means and methods planned to be used to place the bascule machinery.

7. Means and methods planned to be used to place the bascule superstructure.

8. Planned production rates for the caisson cofferdams.

9. Planned production rates for caisson concrete construction by each segment of the caisson.

10. Planned production rates for bascule pier concrete construction.

11. Planned production rates for drilled shaft construction.

If Bidders provide rolled up take off sheets or electronic data for any aspect of the Escrow Bid Documentation, Bidders must also provide the backup documentation supporting the rolled up take off sheets and electronic data.

The Bidder(s) shall provide the Escrow Bid Documentation as defined above for all subcontractors, suppliers, and materialmen.

The term Escrow Bid Documentation does not include the bid documents provided by King County for use by the Bidders in bidding on this Contract.

Unsuccessful Bidders shall not destroy, throw away, write over any Escrow Bid Documentation or any other documentation used in, referenced, referring to the Bidder's bid until the return of the Bidder's bid bond by King County.

<u>Delivery Of Bid Documentation</u>: To The County: Within four (4) business days after bid opening the apparent low Bidder and second low Bidder shall submit Bid Documentation to:

Darren R. Chernick, Contract Specialist
King County Procurement and Contract Services Section
401 Fifth Avenue
3rd Floor Chinook Building
Seattle, Washington 98104.

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If a Bidder has submitted Escrow Bid Documentation pursuant to this section, but does not become the Contractor, its Escrow Bid Documentation will be returned with its bid bond.

Escrow Bid Documentation shall be submitted as follows:

1. All Escrow Bid Documentation shall be in folder(s) or three-ring binder(s). The folder(s) or three ring binder(s) shall be clearly marked "Escrow Bid Documentation - Contract No. C00497C10" and shall contain the Bidder's name, contact person, telephone number, and date of submittal. Such Escrow Bid Documentation shall be kept by King County Procurement and Contract Services Section (PCSS) in a separate sealed container for the duration of the Contract.

2. Bidders shall mark any of all of pages of the Bid Documentation it considers proprietary or confidential accordingly. Such information will be treated as such by King County; however, the County cannot insure that this information would not be subject to release pursuant to a public disclosure request. In the event the County receives a request for such information, the County will immediately advise the Bidder and will not release the marked documents for a period of not less than ten days in order to give the Bidder an opportunity to obtain a court order prohibiting the release of the information in response to the public disclosure request.

3. The writing on the pages shall be legible.

4. The paper shall be white in color or some other light (neutral) colored paper.

Bidders shall include with their Escrow Bid Documentation an affidavit signed under oath by an individual authorized by the Bidder to execute bids and contracts.

1. The affidavit shall list each document with sufficient specificity and reference page number(s) so that a comparison can be made between the list, the Contract specification numbers, and the Bid Documentation to ensure that all Escrow Bid Documentation listed in the affidavit has been enclosed and that all documentation has been provided to the County.

2. The affidavit shall state that the affiant has personally examined the Escrow Bid Documentation and that any and all documentation that was used in preparing the bid and that supports how the bid price was calculated was provided to the County.

Documents listed in the affidavit but not included in the folder(s) or three ring binder(s) through error or oversight by the Bidder shall be submitted to the County within two business days after notification from the County that Bid Documentation is missing or within two business days after the Bidder becomes aware of the error.

Prior to Contract Award, the County and the apparent low Bidder shall meet to review the Bid Documentation to ensure that the submitted Bid Documentation satisfies the requirements of this Specification.

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If the County determines that the Escrow Bid Documentation is illegible, not electronically accessible, or not submitted in accordance with this section, the Bidder shall:

1. Provide legible copies of the Bid Documentation;
2. Supply the software necessary to access the of the Bid Documentation; and,
3. Comply with the requirements of this section within two business days of the County's request.

If the County believes that the Bidder has not provided all Escrow Bid Documentation, the Bidder must, within two business days of the County's request, supply additional documentation or an explanation as to why the documentation does not exist.

Failure to submit Escrow Bid Documentation within the times prescribed, failure to be cooperative with the County in providing the Bid Documentation, and destruction of Bid Documents is just reason for a Bidder to be found not responsible and the County may reject the Bidder as not responsible.

Use of Bid Documentation: The Bidder(s)/Contractor agrees that the Escrow Bid Documentation shall contain all documentation used in preparing the bid. No other Bid Documentation concerning the Contractor's calculation of its bid shall be utilized by the Contractor during disputes and/or litigation of claims brought by the Contractor arising out of this Contract, unless otherwise approved by King County.

The Escrow Bid Documentation may be reviewed and used by the County to determine the Contractor's bid concept, to evaluate the Contractor's breakdown of contract price, evaluate productivity and schedule, negotiate price adjustments under the Contract, evaluate Requests For Information, Requests For Change Order, Change Proposals, Claims or for any other reason related to the Contract.

The County may copy the Escrow Bid Documents and may provide the working copy(s) to County personnel, agents, or consultants. The County, its agents, and consultants, may maintain such working copies of the Bid Documents and at the request of Project Representative, all copies of Escrow Bid Documents will be returned to PCSS or destroyed.

If a Disputes Review Board or mediator is used to resolve disputed claims, the Board members and/or mediator shall have unrestricted use and access to the Escrow Bid Documentation for purposes of evaluating, understanding, resolving and settling disputes/claims. The Dispute Review Board or Mediator shall maintain submitted documents in a sealed file, marked confidential and proprietary and returned to PCSS at the conclusion of the DRB or mediation process.

1-03.2 AWARD OF CONTRACT

This section is deleted in its entirety and replaced with the following:

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Normally, Contract Award or Bid rejection will occur within 90 calendar days after Bid opening. If the lowest responsible Bidder and the Contracting Agency agree, this deadline may be extended. If they cannot agree on an extension by the 90-calendar day deadline, the Contracting Agency reserves the right to Award the Contract to the next lowest responsible Bidder or reject all Bids. The Contracting Agency will notify the successful Bidder of the Contract Award in writing.

1-03.3 EXECUTION OF CONTRACT

This section is deleted in its entirety and replaced with the following:

Copies of the Contract Provisions, including the unsigned Form of Contract, will be included with the Notice of Selection from the County for signature by the successful Bidder. The number of copies to be executed by the Contractor will be determined by the County.

Within ten (10) business days after receiving the Notice of Selection, the successful bidder shall return the signed County-prepared contract, an insurance certification as required by Section 1-07.18, and a satisfactory bond as required by law and Section 1-03.4 Before execution of the contract by the County, the successful bidder shall provide any pre-award information the County may require under Section 1-02.15.

Until the County executes a contract, no proposal shall bind the County, nor shall any work begin within the project limits or within County-furnished sites. The Contractor shall bear all risks for any work begun outside such areas and for any materials ordered before the contract is executed by the County.

If the Bidder experiences circumstances beyond their control that prevents return of the Contract Documents within 10 days after receiving the Notice of Selection, the County may grant up to a maximum of 10 additional days for return of the documents, provided the County deems the circumstances warrant it.

1-03.3(1) REQUIRED SUBMITTALS PRIOR TO CONTRACT EXECUTION (NEW SECTION)

The selected Bidder shall submit the following Forms within ten days after receiving written Notice of Selection:

1. A Personnel Inventory Report on the form provided by the County.
2. An Affidavit and Certificate of Compliance Demonstrating the Contractor's commitment to comply with the provisions of KCC Chapter 12.16.
3. A Statement of Compliance with KCC Chapter 12.16 from any labor unions or employee referral agencies, which refers workers or employees, or provides or supervises apprenticeship or other training programs from whom Contractor obtains employees.

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4. A 504/ADA Disability Assurance of Compliance on the form provided by the County.

5. List of Subcontractors and Suppliers at all levels on the form provided by the County.

The Contractor shall also submit Personnel Inventory Reports, Affidavits and Certificates of Compliance and Sworn Statements of Compliance from its subcontractors, regardless of tier. Such subcontractor information shall be submitted prior to the County processing and paying any progress payment which includes such subcontractor work.

Assistance with the requirements of this Section and copies of Chapters 12.16 and 12.18 are available from the Business Development and Contract Compliance Division, phone (206) 205-0700.

The County will not execute an agreement or contract without prior receipt of fully executed forms listed above.

1-03.7 JUDICIAL REVIEW

The final sentence is deleted and replaced with the following:

Such review, if any, shall be timely filed in the Superior Court of King County, Washington.

1-04 SCOPE OF THE WORK

1-04.1 INTENT OF THE CONTRACT

This section is deleted in its entirety and replaced with the following:

The Contract Documents constitute the entire and integrated agreement between the parties hereto and supersede all prior negotiations, representations, or agreements, either written or oral.

The Contract Documents shall not be construed to create a contractual relationship between any parties other than the County and the Contractor. No contract between the County and a third party shall be construed to create any duty on the part of the County or such third party to the Contractor. The Contractor is not an intended or incidental beneficiary of any promises made in the County's contract with a third party, if any.

The Contract Documents are intended to be complementary. What is required by one part of the Contract shall be as binding as if required by all. Should any conflict or inconsistency be found in the Contract Documents, the County shall resolve any such conflict or inconsistency in accordance with provision 1-04.2.

Where the words "similar," "typical" (or their equivalents) are used in the Contract, they shall mean nearly corresponding or having a likeness. Such words shall not be construed to mean that all parts of the Work referred to are identical or substantially identical, or that such elements of the Work are connected identically or substantially identically to the rest of the Work. The Contractor has the responsibility to determine all details of the Work in relation to their location and connection to other parts of the Work. Words importing the singular number may also be

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applied to the plural of persons and things; words importing the plural may be applied to the singular; and words importing the male gender may be extended to females also.

The organization of the specifications into divisions, provisions and articles and the organization of the drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade...

1-04.2 COORDINATION OF CONTRACT DOCUMENTS, PLANS, SPECIAL PROVISIONS, SPECIFICATIONS AND ADDENDA

The precedence list in the second paragraph is deleted and replaced with the following:

1. Change Order
2. Agreement or Contract Form
3. Addenda
4. Proposal Form
5. Special Provisions, including permit conditions
6. Contract Plans
7. Amendments to the Standard Specifications
8. Standard Specifications
9. 2007 King County Road Design and Construction Standards
10. WSDOT Standard Plans
11. Remainder of Contract Documents

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1-05 CONTROL OF WORK

1-05.1 AUTHORITY OF THE ENGINEER

The following is inserted at the beginning of this section:

The Engineer is the County's point of contact for the Contractor. The County shall identify a Project Engineer and Inspector and delineate the Project Engineer's and Inspector's authority prior to or concurrent with the County's issuance of the Notice to Proceed. Unless the County, in writing, indicates otherwise, the authority to (1) commit to or bind the County to any Change Orders or (2) sign the contract or change orders rests solely in the King County Executive or its designee. When appropriate, the Engineer shall provide the Contractor with a delegation of authority which identifies the person who has authority to sign the contract and/or bind the County to changes in Contract Price.

The Engineer shall be responsible for ensuring strict compliance with the terms of the Contract and safeguarding the interest of the County in its contractual relationships. The Engineer shall

have the authority to administer the Contract. Administration of the contract by the Engineer includes but is not limited to:

1. Receiving all correspondence and information from the Contractor;
2. Issuing Field Directives;
3. Issuing Request for Change Proposals;
4. Responding to Requests For Information;
5. Reviewing the schedule of values, project schedules, submittals, testing and inspection reports, substitution requests, and other documentation submitted by the Contractor;
6. Negotiating Change Proposals and Change Orders;
7. Recommending Change Orders for approval by the King County Executive or its designee;
8. Issuing decisions with respect to Requests for Change Orders and Claims;
9. Processing payment requests submitted by the Contractor, and recommending payment;
10. Monitoring the quality of the work and recommending acceptance of the work;
11. Transmitting executed Change Orders, Amendments, and other contract documents to the Contractor; and
12. Performing all other contract administrative functions.

All correspondence, questions, and/or documentation shall be submitted to the Engineer and the Engineer shall disseminate such documentation appropriately.

The Engineer may designate an authorized assistant to perform functions under the Contract, such as review and/or inspection and acceptance of supplies, services, including construction, and other functions of a technical or administrative nature. The Engineer will provide a written notice of such designation to the Contractor. The Engineer may add to or modify in writing these designations from time to time. The designation letter will set forth the authorities and limitations of the authorized assistants under the Contract. The Engineer authorized assistants cannot grant greater authority than the authority of the Engineer.

1-05.3 PLANS AND WORKING DRAWINGS

The second paragraph is deleted and replaced with the following:

In the event that it is found that the instructions and drawings contained in the contract documents are not sufficiently clear to permit the Contractor to proceed with the work, the Engineer will either upon his own motion or upon request from the Contractor, furnish such

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additional written instructions together with such additional drawings as may be necessary. When such request is made by the Contractor it must be made in ample time to permit the preparation of the instructions and drawings by the Engineer before construction of the work covered by them is undertaken. Such additional instructions and drawings will not be inconsistent with the contract documents and shall have the same force and effect as if contained in the contract documents.

The third paragraph is deleted and replaced with the following:

The Contractor shall submit supplemental Working Drawings as required for the performance of the Work. Except as noted, all drawings and other submittals shall be delivered directly to the Engineer. The drawings shall be provided in hardcopy and executable electronic CAD (Computer Aided Design or Computer Aided Drafting) format. The hardcopy drawings shall be provided on sheets measuring 22 by 34-inches, 11 by 17-inches, or on sheets with dimensions in multiples of 8-½ by 11-inches. The executable electronic CAD format drawings shall be provided in Bentley MicroStation V8 format or AutoCAD 2006 format. The drawings shall be provided far enough in advance of actual need to allow for the review process by the Contracting Agency or other agencies. This may involve resubmittals because of revisions or rejections. Unless otherwise stated in the Contract, the Engineer will require up to 30-calendar days from the date the submittals or resubmittals are received until they are sent to the Contractor. After a plan or drawing has been approved and returned to the Contractor, all changes that the Contractor proposes shall be submitted to the Project Engineer for review and approval. This time will increase if the drawings submitted do not meet the Contract requirements or contain insufficient details.

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1-05.3(1) EQUIPMENT LISTS AND OTHER SUBMITTALS (NEW SECTION)

The Contractor shall submit Equipment lists and schedules of reinforcement bars [bar lists – See 6-02.3(24)], and other required submittals for approval by the Engineer. The Engineer will respond to requests for approval within time frames specified in each Section of the Specifications that requires such approval.

1-05.4 CONFORMITY WITH AND DEVIATIONS FROM PLANS AND STAKES

The following is added at the end of the third paragraph:

The Engineer will furnish the Contractor with stake-out sheets of construction points for drainage structures, swales, rain gardens and earth berms on each street of the Project Site. The stake out sheets shall list the street monument line alignment stationing, the offset from street monument line and the elevation. (See Section 2-03.3(19) Swales, Rain Gardens and Earth Berms for additional survey information.)

1-05.4(1) CONTRACTOR SURVEYING – ROADWAY (NEW SECTION)

Copies of the Contracting Agency provided primary survey control data are available for the bidder's inspection at the office of the Project Engineer.

The Contractor shall be responsible for setting, maintaining, and resetting all alignment stakes, slope stakes, and grades necessary for the construction of the roadbed, drainage, surfacing, paving, channelization and pavement marking, illumination and signals, guardrails and barriers, and signing. Except for the survey control data to be furnished by the Contracting Agency, calculations, surveying, and measuring required for setting and maintaining the necessary lines and grades shall be the Contractor's responsibility.

Detailed survey records shall be maintained, including a description of the work performed on each shift, the methods utilized, and the control points used. The record shall be adequate to allow the survey to be reproduced. A copy of each day's record shall be provided to the Engineer within three working days after the end of the shift.

The meaning of words and terms used in this provision shall be as listed in "Definitions of Surveying and Associated Terms" current edition, published by the American Congress on Surveying and Mapping and the American Society of Civil Engineers.

The survey work shall include but not be limited to the following:

1. Verify the primary horizontal and vertical control furnished by the Contracting Agency, and expand into secondary control by adding stakes and hubs as well as additional survey control needed for the project. Provide descriptions of secondary control to the Contracting Agency. The description shall include coordinates and elevations of all secondary control points.

2. Establish, the centerlines of all alignments, by placing hubs, stakes, or marks on centerline or on offsets to centerline at all curve points (PCs, PTs, and PIs) and at points on the alignments spaced no further than 50 feet.

3. Establish clearing limits, placing stakes at all angle points and at intermediate points not more than 50 feet apart. The clearing and grubbing limits shall be 5 feet beyond the toe of a fill and 10 feet beyond the top of a cut unless otherwise shown in the Plans.

4. Establish grading limits, placing slope stakes at centerline increments not more than 50 feet apart. Establish offset reference to all slope stakes. If Global Positioning Satellite (GPS) Machine Controls are used to provide grade control, then slope stakes may be omitted at the discretion of the Contractor

5. Establish the horizontal and vertical location of all drainage features, placing offset stakes to all drainage structures and to pipes at a horizontal interval not greater than 25 feet.

6. Establish roadbed and surfacing elevations by placing stakes at the top of subgrade and at the top of each course of surfacing. Subgrade and surfacing stakes shall be set at horizontal intervals not greater than 50 feet in tangent sections, 25 feet in curve sections with a radius less than 300 feet, and at 10-foot intervals in intersection radii with a radius less than 10 feet. Transversely, stakes shall be placed at all locations where the roadway slope changes and at additional points such that the transverse spacing of stakes is not

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more than 12 feet. If GPS Machine Controls are used to provide grade control, then roadbed and surfacing stakes may be omitted at the discretion of the Contractor.

7. Establish intermediate elevation benchmarks as needed to check work throughout the project.

8. Provide references for paving pins at 25-foot intervals or provide simultaneous surveying to establish location and elevation of paving pins as they are being placed.

9. For all other types of construction included in this provision, (including but not limited to channelization and pavement marking, illumination and signals, guardrails and barriers, and signing) provide staking and layout as necessary to adequately locate, construct, and check the specific construction activity.

10. The Contractor shall collect additional topographic survey data as needed in order to match into existing roadways such that the transition from the new pavement to the existing pavement is smooth and that the pavement and ditches drain properly. If changes to the profiles or roadway sections shown in the contract plans are needed to achieve proper smoothness and drainage where matching into existing features, the Contractor shall submit these changes to the Project Engineer for review and approval 10 days prior to the beginning of work.

The Contractor shall provide the Contracting Agency copies of any calculations and staking data when requested by the Engineer.

To facilitate the establishment of these lines and elevations, the Contracting Agency will provide the Contractor with primary survey control information consisting of descriptions of two primary control points used for the horizontal and vertical control, and descriptions of two additional primary control points for every additional three miles of project length. Primary control points will be described by reference to the project alignment and the coordinate system and elevation datum utilized by the project. In addition, the Contracting Agency will supply horizontal coordinates for the beginning and ending points and for each Point of Intersection (PI) on each alignment included in the project.

The Contractor shall ensure a surveying accuracy within the following tolerances:

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	Vertical	Horizontal
Slope stakes	±0.10 feet	±0.10 feet
Subgrade grade stakes set 0.04 feet below grade	±0.01 feet	±0.5 feet (parallel to alignment)
		±0.1 feet (normal to alignment)
Stationing on roadway	N/A	±0.1 feet
Alignment on roadway	N/A	±0.04 feet
Surfacing grade stakes	±0.01 feet	±0.5 feet (parallel to alignment)
		±0.1 feet (normal to alignment)
Roadway paving pins for surfacing or paving	±0.01 feet	±0.2 feet (parallel to alignment)
		±0.1 feet (normal to alignment)

The Contracting Agency may spot-check the Contractor's surveying. These spot-checks will not change the requirements for normal checking by the Contractor.

When staking roadway alignment and stationing, the Contractor shall perform independent checks from different secondary control to ensure that the points staked are within the specified survey accuracy tolerances.

The Contractor shall calculate coordinates for the alignment. The Contracting Agency will verify these coordinates prior to issuing approval to the Contractor for commencing with the work. The Contracting Agency will require up to seven calendar days from the date the data is received.

Contract work to be performed using contractor-provided stakes shall not begin until the stakes are approved by the Contracting Agency. Such approval shall not relieve the Contractor of responsibility for the accuracy of the stakes.

Stakes shall be marked in accordance with Standard Plan A10.10-00. When stakes are needed that are not described in the Plans, then those stakes shall be marked, at no additional cost to the Contracting Agency as ordered by the Engineer.

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Payment

Payment will be made in accordance with Section 1-04.1 for the following bid item when included in the proposal:

"Roadway Surveying", lump sum.

The lump sum contract price for "Roadway Surveying" shall be full pay for all labor, equipment, materials, and supervision utilized to perform the work specified, including any resurveying, checking, correction of errors, replacement of missing or damaged stakes, and coordination efforts.

1-05.4(2) CONTRACTOR SURVEYING – STRUCTURE (NEW SECTION)

Copies of the County- provided primary survey control data are available for the bidder's inspection at the office of the Project Engineer.

The Contractor shall be responsible for setting, maintaining, and resetting all alignment stakes, slope stakes, and grades necessary for the construction of bridges, noise walls, and retaining walls. Except for the survey control data to be furnished by the County, calculations, surveying, and measuring required for setting and maintaining the necessary lines and grades shall be the Contractor's responsibility.

Detailed survey records shall be maintained, including a description of the work performed on each shift, the methods utilized, and the control points used. The record shall be adequate to allow the survey to be reproduced. A copy of each day's record shall be provided to the Engineer within three working days after the end of the shift.

The meaning of words and terms used in this provision shall be as listed in "Definitions of Surveying and Associated Terms" current edition, published by the American Congress on Surveying and Mapping and the American Society of Civil Engineers.

The survey work by the Contractor shall include but not be limited to the following:

1. Verify the primary horizontal and vertical control furnished by the Contracting Agency, and expand into secondary control by adding stakes and hubs as well as additional survey control needed for the project. Provide descriptions of secondary control to the Contracting Agency.
2. Establish, by placing hubs and/or marked stakes, the location with offsets of foundation shafts and piles.
3. Establish offsets to footing centerline of bearing for structure excavation.
4. Establish offsets to footing centerline of bearing for footing forms.
5. Establish wing wall, retaining wall, and noise wall horizontal alignment.

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6. Establish retaining wall top of wall profile grade.
7. Establish elevation benchmarks for all substructure formwork.
8. Check elevations at top of footing concrete line inside footing formwork immediately prior to concrete placement.
9. Check column location and pier centerline of bearing at top of footing immediately prior to concrete placement.
10. Establish location and plumbness of column forms, and monitor column plumbness during concrete placement.
11. Establish pier cap and crossbeam top and bottom elevations and centerline of bearing.
12. Check pier cap and crossbeam top and bottom elevations and centerline of bearing prior to and during concrete placement.
13. Establish grout pad locations and elevations.
14. Establish structure bearing locations and elevations, including locations of anchor bolt assemblies.
15. Establish girder and/or web wall profiles and locations.
16. Establish diaphragm locations and centerline of bearing.
17. Establish roadway slab grades and provide dimensions from top of girder to top of roadway slab. Set elevations for deck paving machine rails.
18. Establish traffic barrier and curb profile and alignment on roadway slab.
19. Establish the location of the fenders system piles.
20. Establish the location of caisson cofferdams.
21. Establish the location of caisson foundations.

Establish caisson centerlines for caisson sinking and caisson forms.

22. Establish elevation benchmarks for all segments of the caisson formwork.
23. Check elevations at top of caisson concrete line inside caisson formwork immediately prior to concrete placement.
24. Check caisson centerlines of caisson immediately prior to caisson cap concrete placement.
25. Establish location of trunnion frame anchorages.
26. Establish locations of trunnion frames.

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27. Check trunnion frame locations immediately prior to and after final adjustments to the trunnion frame to trunnion anchorage connections.

The Contractor shall provide the County copies of any calculations and staking data when requested by the Engineer.

To facilitate the establishment of these lines and elevations, the County will provide the Contractor with the following primary survey and control information:

1. Descriptions of two primary control points used for the horizontal and vertical control. Primary control points will be described by reference to the project alignment and the coordinate system and elevation datum utilized by the project. In addition, the County will supply horizontal coordinates for the beginning and ending points and for each Point of Intersection (PI) on each alignment included in the project.

2. Horizontal coordinates for the centerline of each bridge pier.

3. Computed final in place elevations at top of bridge roadway decks at one-tenth points along centerline of each girder web. All form grades and other working grades shall be calculated by the Contractor.

The Contractor shall give the County three weeks notification to allow adequate time to provide the data outlined in Items 2 and 3 above. The Contractor shall ensure a surveying accuracy within the following tolerances:

	Vertical	Horizontal
1. Stationing on structures		±0.02 feet
2. Alignment on structures		±0.02 feet
3. Superstructure elevations	±0.01 feet variation from Plan elevation.	
4. Substructure	±0.02 feet variation from Plan grades.	

The County may spot-check the Contractor's surveying. These spot-checks will not change the requirements for normal checking by the Contractor.

When staking the following items, the Contractor shall perform independent checks from different secondary control to ensure that the points staked for these items are within the specified survey accuracy tolerances:

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1. Piles
2. Shafts
3. Footings
4. Columns
5. Caissons
6. Caisson caps
7. Trunnion anchorages
8. Trunnion frames

The Contractor shall calculate coordinates for the points associated with piles, shafts, footings, columns, caissons, caisson caps, trunnion frame anchorages and trunnion frames. The County will verify these coordinates prior to issuing approval to the Contractor for commencing with the survey work. The County will require up to five working days from the date the data is received to issuing approval.

The Contractor shall monitor the settlement of Piers 3 and 4. A minimum of three datum points for reference shall be established by the Contractor at locations approved by the Engineer and shall be maintained outside of the limits of construction. The Contractor shall establish four permanent reference points on each pier within the horizontal surface of the pedestrian railing curb within two weeks after construction of the curbs. Permanently identify the reference points with stainless steel or brass discs approximately 2 inches in diameter embedded in the curb concrete. Level measurements shall be taken with a closed survey on two datum points to an accuracy of plus or minus 0.002 foot on the following schedule:

1. After the pedestrian curb has been initially constructed, the Contractor shall establish baseline readings in X, Y and Z coordinates.
2. Bi-weekly readings shall be taken thereafter until vehicular traffic is placed on the bridge.
3. Monthly readings shall be taken thereafter until demolition of that portion of the existing bridge within the Duwamish Waterway is completed.

Contract work to be performed using Contractor-provided stakes or other temporary means shall not begin until the stakes are approved by the County. Such approval shall not relieve the Contractor of responsibility for the accuracy of the stakes.

Payment: Payment will be made in accordance with Section 1-04.1 for the following bid item when included in the Proposal:

"Structure Surveying", lump sum.

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The lump sum contract price for "Structure Surveying" shall be full pay for all labor, equipment, materials, and supervision utilized to perform the work specified, including any resurveying, checking, correction of errors, replacement of missing or damaged stakes, and coordination efforts.

1-05.5 RECORD DRAWINGS AND CONTRACT DOCUMENTS (NEW SECTION)

The Contractor shall keep one copy of the Contract Documents, including the Standard Specifications on the job site, in good order, available to the Engineer, the Engineer's authorized assistants and the County.

The Contractor shall maintain, updated on a daily basis at the job site, and make available to the Engineer on request, a record set of the Plans accurately marked to indicate modifications in the completed work that differ from the design information shown in the Plans.

1-05.7 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK

The following is added at the end of this section:

Any nonconforming or defective work, whether the result of poor workmanship, use of defective materials, damage through carelessness, failure to furnish materials or to perform the work in accordance with the contract documents, or any other cause found to exist during construction or prior to final acceptance, shall be removed immediately and replaced by work and materials which shall conform to the contract documents or shall be remedied otherwise in a manner acceptable to and as authorized by the Engineer. These provisions shall have full effect regardless of the fact that the defective work was performed, or the defective materials were used, with the full knowledge of the Engineer. The fact that the Engineer may have previously overlooked such defective work shall not constitute an acceptance of any part of work or a waiver. Nothing stated herein shall be deemed to shorten the term of any statute of limitations applicable to claims which the County may have against the Contractor.

Work done contrary to or regardless of the instructions of the Engineer, work done beyond the requirements of the contract documents, or any extra or additional work done without authority, will be considered as unauthorized and will not be paid for by the County, even if retained. Work so performed may be ordered removed or replaced at the Contractor's expense.

While the Engineer will endeavor to point out to the Contractor any defective work which comes to the attention of the Engineer during these observations, the Engineer's failure to do so shall not constitute the basis of any claim, suit or cause of action by the Contractor or any other party against the Engineer or the County, and shall not excuse nonconforming or defective work by the Contractor.

The Engineer or the County shall be allowed access to all parts of the work at all times and shall be furnished with every reasonable facility for ascertaining whether the work as performed is in accordance with the requirements and intent of the Contract Documents. If directed by the Engineer, the Contractor, at any time before acceptance of the Work, shall remove or uncover

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such portions of the finished work. After examination, the Contractor shall restore said portions of the Work to the standards required by the Specifications. Should the work thus exposed or examined prove acceptable, the uncovering or removing and the replacing of the covering or making good of the parts removed, will be paid for as provided under Section 1-04.4, but should the work so exposed or examined prove unacceptable, the uncovering or removing and the replacing of the covering or making good of the parts removed, shall be at the Contractor's expense. Observation of the work by the Engineer shall not be considered as direct control of the individual workman and his work. The direct control shall be solely the responsibility of the Contractor.

1-05.12 FINAL ACCEPTANCE

This section is deleted in its entirety and replaced with the following:

The Contractor must perform all the obligations under the contract before a completion date and final acceptance can occur. Failure of the Contractor to perform all the obligations under the contract shall not bar King County from unilaterally accepting the contract as provided in Section 1-09.9.

The Director of Transportation, or a duly authorized assistant, accepts the completed contract and the items of work shown in the Comparison of Quantities by signature of the Notice of Completion and Acceptance. The date of that signature constitutes the acceptance date. Progress estimates or payments shall not be construed as acceptance of any work under the contract.

The Contractor agrees that Final Acceptance shall not relieve the Contractor of the responsibility to indemnify, defend and protect King County against any claim or loss resulting from the failure of the Contractor (or the subcontractors or lower-tier subcontractors) to pay all laborers, mechanics, subcontractors, materialpersons or any other person who provides labor, supplies or provisions for carrying out the work.

Final Acceptance shall not constitute acceptance of any unauthorized or defective work or material. King County shall not be barred from requiring the Contractor to remove, replace, repair or dispose of any unauthorized or defective work or material or from recovering damages for any such work or material.

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1-05.13 SUPERINTENDENTS, LABOR AND EQUIPMENT OF CONTRACTOR

The seventh paragraph is deleted and replaced with the following:

Whenever the Contracting Agency evaluates the Contractor's qualifications pursuant to Section 1-02.1, it will take these performance reports into account.

1-05.15 METHOD OF SERVING NOTICES

The second paragraph is deleted and replaced with the following:

All correspondence from the Contractor shall be directed to the Project Engineer. <u>All correspondence from the Contractor constituting any notification, notice of protest, notice of dispute, or other correspondence constituting notification required to be furnished under the</u>

Contract, must be in paper format, hand delivered or sent via mail delivery service to the Project Engineer's office. Electronic copies such as e-mails or electronically delivered copies of correspondence will not constitute such notice and will not comply with the requirements of the Contract.

1-06 CONTROL OF MATERIAL

1-06.1 APPROVAL OF MATERIALS PRIOR TO USE

The first paragraph is deleted and replaced with the following:

Prior to use or delivery to the project site, the Contractor shall notify the Engineer of all proposed materials. The Contractor shall use the Request for Approval of Material Sources (RAMS) form. These sources must be approved by the Engineer before delivery to the project site begins. The Contractor may utilize pre-approved materials shown on the Qualified Products List (QPL), but submittal of such items shall be documented on a RAMS.

1-06.1(2) REQUEST FOR APPROVAL OF MATERIAL SOURCES (RAMS)

The first paragraph is deleted and replaced with the following:

The RAMS shall be used for all materials to be incorporated into the work. The RAMS shall be prepared by the Contractor in accordance with the instructions on the form and submitted to the Engineer for approval before the material is delivered to the project site or incorporated into the work. When pre-approved items from the QPL are proposed, a copy of the applicable page from the QPL, marked per the instructions in the QPL, shall be submitted with the RAMS.

1-06.1(4) SHOP INSPECTION EXPENSE (NEW SECTION)

Additional shop inspection expenses will be sustained by King County if all or a portion of shop fabricated items containing structural steel are fabricated at some distance from Contracting Agency inspection facilities.

It is impractical and difficult to determine the actual increase in inspection expenses. To cover such additional fabrication inspection expenses for shop fabricated items containing structural steel, the Contractor agrees to pay and authorizes and directs the King County to deduct from any monies due or coming due to the Contractor the sums shown on the following schedule for fabrication inspection expenses:

Zone	Place of Fabrication	Reduction in Payment
I	Within 300 air line miles of Seattle	None
II	Between 300 and 3,000 air line miles from Seattle	$0.005 per pound but not less than $2,000

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III	Over 3,000 air line miles from Seattle	$0.006 per pound but not less than $4,000

Where fabrication of a member takes place in more than one zone, the reduction in payment will be computed on the basis of the entire member being fabricated in the farthest of the zones where any fabrication takes place on that member.

1-06.1(5) BUY AMERICA (NEW SECTION)

The major quantities of steel and iron construction material that is permanently incorporated into the project shall consist of American-made materials only. Buy America does not apply to temporary steel items, e.g., temporary sheet piling, temporary bridges, steel scaffolding and falsework.

The Contractor may utilize minor amounts of foreign steel and iron in this project provided the cost of the foreign material used does not exceed one-tenth of one percent of the total contract cost or $2,500.00, whichever is greater.

American-made material is defined as material having all manufacturing processes occurring domestically. To further define the coverage, a domestic product is a manufactured steel material that was produced in one of the 50 States, the District of Columbia, Puerto Rico, or in the territories and possessions of the United States.

If domestically produced steel billets or iron ingots are exported outside of the area of coverage, as defined above, for any manufacturing process then the resulting product does not conform to the Buy America requirements. Additionally, products manufactured domestically from foreign source steel billets or iron ingots do not conform to the Buy America requirements because the initial melting and mixing of alloys to create the material occurred in a foreign country.

Manufacturing begins with the initial melting and mixing, and continues through the coating stage. Any process which modifies the chemical content, the physical size or shape, or the final finish is considered a manufacturing process. The processes include rolling, extruding, machining, bending, grinding, drilling, welding, and coating. The action of applying a coating to steel or iron is deemed a manufacturing process. Coating includes epoxy coating, galvanizing, aluminizing, painting, and any other coating that protects or enhances the value of steel or iron. Any process from the original reduction from ore to the finished product constitutes a manufacturing process for iron.

Due to a nationwide waiver, Buy America does not apply to raw materials (iron ore and alloys), scrap (recycled steel or iron), and pig iron ore processed, pelletized, and reduced iron ore.

The following are considered to be steel manufacturing processes:

1. Production of steel by any of the following processes:

    a. Open hearth furnace.

Rev. Submittal - Not for Construction

b. Basic oxygen.

c. Electric furnace.

d. Direct reduction.

2. Rolling, heat treating, and any other similar processing.

3. Fabrication of the products.

a. Spinning wire into cable or strand.

b. Corrugating and rolling into culverts.

c. Shop fabrication.

A certification of materials origin will be required for any items comprised of, or containing, steel or iron construction materials prior to such items being incorporated into the permanent work. The certification shall be on DOT Form 350-109EF provided by the Engineer, or such other form the Contractor chooses, provided it contains the same information as DOT Form 350-109EF.

1-06.2(1) SAMPLES AND TESTS FOR ACCEPTANCE

The first sentence of the fifth paragraph is deleted and replaced with the following:

All field and laboratory and materials testing by the Engineer will follow methods described in the contract documents, in the Washington State Department of Transportation Materials Manual, or ASTM or AASHTO national standard test procedures, using qualified testing personnel and calibrated or verified equipment.

1-06.3 MANUFACTURER'S CERTIFICATE OF COMPLIANCE

The third paragraph is deleted and replaced with the following:

The Manufacturer's Certificate of Compliance must identify the manufacturer, the type (and lot number, if applicable) and quantity of material being certified, the applicable specifications being affirmed, and the signature of a responsible corporate official of the manufacturer and include supporting mill tests or documents. An invoice and a Manufacturer's Certificate of Compliance shall be furnished with each truckload of material delivered to the work and the truckload so certified shall be clearly identified in the certificate.

1-07 LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC

1-07.1(1) LEAD HEALTH PROTECTION PROGRAM (NEW SECTION)

Structural and non-structural materials located at the project site contain lead-based products. The Contractor shall be fully responsible for the safety and health of all on-site workers and compliant with Washington Administrative Code (WAC 296-155-176). The Contractors Lead

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Health Protection Program shall be sent to the Contracting Agency at least 10 working days prior to the Contractor beginning work involving exposure to lead contamination. The Contractor shall communicate with the Project Engineer to ensure a coordinated effort for providing and maintaining a safe worksite for both the Contracting Agency's and Contractor's workers.

The compliance programs shall be reviewed and signed by a Certified Industrial Hygienist (CIH) who is certified in comprehensive practice by the American Board of Industrial Hygiene (ABIH). Copies of all air monitoring or jobsite inspection reports made by or under the direction of the CIH shall be furnished to the Engineer within 10 working days after the date of monitoring or inspection.

Construction Requirements

The Contractor shall be responsible for the containment measures required to provide and maintain a safe and healthful jobsite for the duration of the project in accordance with all applicable laws and this Special Provision.

Payment

All costs to comply with this Special Provision for the Lead Health Protection laws and regulations are the responsibility of the Contractor and shall be included in related items of work.

1-07.2 STATE SALES TAXES

The following is inserted at the end of this section:

The work on this Contract will be performed upon non-State lands. The Contractor shall pay State sales tax in accordance with the provisions of Section 1-07.2(1) of the Standard Specifications.

1-07.5(4)A FUGITIVE DUST (NEW SECTION)

The Puget Sound Clean Air Agency and King County recognize that fugitive dust from construction projects can become an air pollution problem; both organizations share the goal of controlling fugitive dust emissions.

Fugitive Dust control planning represents a partnership between the County, the Contractor, its subcontractors and any other parties whose activities during the project may lead to the generation of fugitive dust. Such a partnership extends to legal responsibilities as well: all parties can be held liable for non-compliance and subsequent regulatory actions up to and, including monetary liabilities.

The Contractor shall incorporate a Fugitive Dust Control Plan (FDCP) as part of its Temporary Erosion and Sediment Control (TESC) Plan. The FDCP shall reflect conditions specific to the project site, the Contractor's operations, and the schedule of work. At a minimum, the Contractor shall develop FDCP in accordance with the Best Management Practices (BMPs) identified in the Associated General Contractors of Washington Education Foundation and

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Fugitive Dust Task Force pamphlet, "Guide To Handling Fugitive Dust From Construction Projects." See Section 8-01.3(1) for additional submittal requirements.

1-07.5(5) ENVIRONMENTAL COMMITMENTS (NEW SECTION)

The following provisions summarize the requirements, in addition to those required elsewhere in the contract, imposed upon the Contracting Agency by the various documents referenced in the Special Provision PERMITS AND LICENSES. Throughout the work, the Contractor shall comply with the following requirements:

General

The Contractor shall ensure that the Project Manager representing the Prime Contractor and all subcontractors has read and understands this Special Provision. Prior to commencing any work on site, the Contractor shall provide the Engineer with a signed statement from the Project Manager stating that the Project Manager has read, understands and will abide by the conditions of this Special Provision.

Wetlands and Water Quality

The following restrictions and requirements pertain to work throughout the project limits:

The Contractor shall dispose of all creosoted timber, creosote piling and associated debris as shown in the Plans in accordance with current federal, state, and local regulations and provisions, and following Best Management Practices. Disposal shall be made in a landfill which meets the liner and leachate standards of the Minimum Functional Standards, Chapter 173-304 WAC. The Contractor shall provide receipts from the disposal facility to the Project Engineer. If the material is transported to a transfer station, the Contractor shall obtain documentation indicating that final disposal will comply with the standards referenced above.

Payment

All costs to comply with this special provision for the environmental commitments and requirements are incidental to the contract and are the responsibility of the Contractor. The Contractor shall include all related costs in the associated bid prices of the Contract.

1-07.5(6) RECYCLED PAPER PRODUCTS (NEW SECTION)

The Contractor shall use recycled paper for the production of all printed and photocopied documents related to the fulfillment of this Contract. If the cost of recycled is more than fifteen percent higher than the cost of non-recycled paper, the Contractor shall notify the County, who may waive the recycled paper requirement.

The Contractor agrees to use both sides of paper sheets for copying and printing, and to use recycled/recyclable products wherever practical.

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1-07.5(7) CONCRETE GRINDING AND SAWCUTTING RESIDUE AND SLURRY (NEW SECTION)

Construction activities that generate residue and slurry from asphalt concrete or Portland cement concrete grinding or sawcutting shall be subject to the following:

Collection, Containment, and Disposal: Removal of residue and slurry from the immediate roadway shall be done on a continuous basis. Residue and slurry shall not be allowed to drain across traffic lanes and shoulders or drain into any stormwater conveyance system, including catch basins, inlets, or ditches. Any discharge to surface waters, including wetlands, is a violation of State water quality standards.

The Contractor shall develop a Collection, Containment, and Disposal Plan identifying how the residue and slurry will be contained and collected. The residue and slurry shall become the property of the Contractor and shall be disposed of by hauling to a Contractor-provided disposal site.

The approved Collection, Containment, and Disposal Plan shall be implemented prior to commencing any pavement grinding or sawcutting operation.

On-Site Disposal: No on-site disposal shall be allowed for this contract.

Submittals

The Contractor shall submit the following items to the Engineer for review and approval a minimum of 15 working days prior to commencing the grinding or sawcutting operation:

1. Collection, Containment, and Disposal Plan (identifying all proposed methods to prevent discharges into the existing drainage systems).
2. Location of all off-site disposal sites, including copies of all applicable permits and approvals for the use of those sites.

Payment

All costs with developing the Collection, Containment, and Disposal Plan and collecting, containing, loading, hauling, and disposing of pavement grinding and sawcutting residue and slurry shall be included in the unit contract prices for the applicable items of work and no additional compensation will be made.

1-07.6 PERMITS AND LICENSES

Section is deleted in its entirety and replaced with the following:

King County has obtained the following permits and approvals for construction of this project:

Federal Permits and Approvals:

National Environmental Policy Act (NEPA) – Record of Decision (ROD)

Section 4(f) Evaluation

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Section 404 – (Federal CWA) Nationwide Permit 15

Section 10 – Rivers and Harbors Act of 1899

Section 9 – General Bridge Permit

Section 106 – Memorandum of Agreement (MOA)

Dredge Material Management Office – Suitability Determination for Open Water Disposal

ESA Section 7

U.S. Fish and Wildlife Service Biological Opinion and Incidental Take Statement

National Marine Fisheries Service Biological Opinion and Incidental Take Statement

Washington State Permits and Approvals:

Hydraulic Project Approval

State Environmental Policy Act (SEPA) – Determination of Significance

Section 401 – Water Quality Certification/Coastal Zone Management Act (CMZA)

Notification of Hazardous Waste Disposal: Form 2

Temporary Authorization for use of Surface Water

National Pollutant Discharge Elimination System (NPDES)

Washington Department of Natural Resources – Disposal Site Use Authorization for Open Water Disposal

King County Department of Development and Environmental Services Permits:

Clearing and Grading Permit

Flood Hazard Certification

Shoreline Substantial Development Permit

Linear Alternation Exemption

King County Landmarks Commission Approval

Certificate of Appropriateness (COA)

City of Seattle Permits:

Street Use Utility Permit

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Port of Seattle Permits:

Easement to Construct over the Duwamish Waterbody Bedlands

The Contractor shall comply with all provisions of the permits and approvals. All contacts with permitting agencies concerning the permits and/or approvals shall be through the Engineer.

All other permits and licenses required for the construction of this project shall be obtained by the Contractor. All permits and licenses shall be kept on-site during construction. The following is a minimum list of Permits to be acquired by the Contractor:

Noise Variance for Night Time Construction

Asbestos Notice of Demolition (Puget Sound Clean Air Agency)

Demolition Permit

Drainage Discharge Permit (if required)

The Contractor shall furnish the Engineer with one copy of each permit issued for borrow, filling, or wasting material required for or generated by the contract work. The Contractor shall notify the Engineer in writing of the location of all borrow, filling, and waste sites regardless of whether a permit is required.

All costs incurred by the Contractor in procuring permits and complying with stipulations in the permits and approvals shall be incidental to and included in the various items of work in the project; no additional compensation will be made.

1-07.6(1) UNITED STATES COAST GUARD (NEW SECTION)

The Contractor shall comply with all United States Coast Guard requirements.

The Contractor shall contact the Coast Guard at least 2 weeks in advance of all work in or near the navigable portion of the waterway and request that a Local Notice to Mariners be issued for the waterway at this site.

The Contractor shall contact the Coast Guard for requirements related to the mooring of barges, placement of log booms, and all other equipment that could be a hazard to waterway users.

Provisions shall be made for the removal, on 2 hours notice, of all equipment that would block or partially block the navigable portion of the waterway.

The Coast Guard contact is:

Bridge Specialist
Aids to Navigation Branch
Thirteenth Coast Guard District
915 Second Avenue

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Seattle, WA 98174-1067
Telephone: (206) 220-7270

All costs incurred in contacting the Coast Guard and in complying with all the requirements specified herein shall be included in the contract prices for the items of work involved.

All costs in connection with delays in the construction caused by the Contractor's failure to contact the Coast Guard shall be at the Contractor's expense.

1-07.9 WAGES

1-07.9(1) GENERAL

The following is added at the end of this section:

The Federal wage rates incorporated in this contract have been established by the Secretary of Labor under United States Department of Labor General Decision No. WA080001.

Application of Wage Rates for the Occupation of Landscape Construction

State prevailing wage rates for public works contracts are included in this contract and show a separate listing for the occupation:

Landscape Construction, which includes several different occupation descriptions such as: Irrigation and Landscape Plumbers, Irrigation and Landscape Power Equipment Operators, and Landscaping or Planting Laborers.

In addition, Federal wage rates that are included in this contract may also include occupation descriptions in Federal Occupational groups for work also specifically identified with landscaping such as:

Laborers with the occupation description, Landscaping or Planting, or

Power Equipment Operators with the occupation description, Mulch Seeding Operator.

If Federal wage rates include one or more rates specified as applicable to landscaping work, then Federal wage rates for all occupation descriptions, specific or general, must be considered and compared with corresponding State wage rates. The higher wage rate, either State or Federal, becomes the minimum wage rate for the work performed in that occupation.

Contractors are responsible for determining the appropriate crafts necessary to perform the contract work. If a classification considered necessary for performance of the work is missing from the Federal Wage Determination applicable to the contract, the Contractor shall initiate a request for approval of a proposed wage and benefit rate. The Contractor shall prepare and submit Standard Form 1444, Request for Authorization of Additional Classification and Wage Rate available at http://www.wdol.gov/docs/sf1444.pdf, and submit the completed form to the Project Engineer's office. The presence of a classification wage on the Washington State Prevailing Wage Rates For Public Works Contracts does not exempt the use of form 1444 for the purpose of determining a federal classification wage rate.

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1-07.10(1) EQUAL BENEFITS (NEW SECTION)

King County's Equal Benefits (EB) Ordinance 14823 states that to be eligible for award of contracts at a cost of $25,000.00 or more, firms must not discriminate in the provisions of employee benefits between employees with spouses, and employees with domestic partners. The successful Contractor, bidder or proposer shall be required to complete a Worksheet and Declaration form. Compliance with Ordinance 14823 is a mandatory condition for execution of a contract. The EB Compliance forms, and Ordinance 14823 are available online at: www.metrokc.gov/finance/procurement/forms.asp.

1-07.11(1)B NON-DISCRIMINATION AND EQUAL EMPLOYMENT OPPORTUNITY (EEO) (NEW SECTION)

Nondiscrimination in Employment and Provision of Services. During the performance of this Contract, neither the Contractor nor any party subcontracting under the authority of this Contract shall discriminate nor tolerate harassment on the basis of race, color, sex, religion, nationality, creed, marital status, sexual orientation, age, or the presence of any sensory, mental, or physical disability in the employment or application for employment or in the administration or delivery of services or any other benefits under this Contract.

Nondiscrimination in Subcontracting Practices. During the solicitation, award and term of this Contract, the Contractor shall not create barriers to open and fair opportunities to participate in County contracts or to obtain or compete for contracts and subcontracts as sources of supplies, equipment, construction and services. In considering offers from and doing business with subcontractors and suppliers, the Contractor shall not discriminate against any person on the basis of race, color, creed, religion, sex, age, nationality, marital status, sexual orientation or the presence of any mental or physical disability in an otherwise qualified disabled person.

Compliance with Laws and Regulations. King County Code Chapters 4.19, 12.16, 12.17 and 12.18 are incorporated by reference as if fully set forth herein and such requirements apply to this Contract. The Contractor shall further comply fully with any affirmative action requirements set forth in any federal regulations, statutes or rules included or referenced in the contract documents.

Record-keeping Requirements and Site Visits. The County may, at any time, visit the Project Site, Contractors' and subcontractors' offices to review records related to the solicitation, utilization, and payment to subcontractors and suppliers in compliance with Executive Order 11246. This provision includes compliance with any other requirements of this Section. The Contractor shall provide all reasonable assistance requested by King County during such visits. The Contractor shall maintain, for at least 12 months after completion of all work under this Contract, the following:

1. Records, including written quotes, bids, estimates or proposals submitted to the Contractor by all businesses seeking to participate on this Contract, and any other information necessary to document the actual use of and payment to subcontractors and suppliers in this Contract, including employment records.

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2. The Contractor shall make the foregoing records available to King County for inspection and copying upon request. If this Contract involves federal funds, the Contractor shall comply with all record keeping requirements set forth in any federal rules; regulations or statutes included or referenced in the Contract documents.

Assistance with the requirements of this Section and copies of Chapters 4.19, 12.16 and 12.18 is available by contacting King County Business Development and Contract Compliance (BDCC) Section at the address below. Please include the contract number in all correspondence.

King County Business Relations and Economic Development
Business Development and Contract Compliance Section
Mail Stop: YES-EX-0510
400 Yesler Way, Suite 510
Seattle, WA 98104
Phone: 206-205-0700, TTY Relay 711
Fax: 206-205-0719

Sanctions for Violations. Any violation of the requirements of the provisions of this Section shall be a material breach of contract, which may result in termination of this Contract or such other remedy as the County deems appropriate, including but not limited to damages or withholding payment.

1-07.11(1)A COMPLIANCE WITH SECTION 504 OF THE REHABILITATION ACT OF 1973, AS AMENDED AND THE AMERICAN WITH DISABILITIES ACT OF 1990 (NEW SECTION)

The Contractor shall complete and require subcontractors to complete a Disability Self-Evaluation Questionnaire for all programs and services offered by the Contractor (including any services not subject to this Contract) and shall evaluate its services, programs and employment practices for compliance with Section 504 of the Rehabilitation Act of 1973, as amended ("504"), and the Americans with Disabilities Act of 1990 ("ADA").

1-07.11(2)B FEDERAL REQUIREMENT FOR AFFIRMATIVE ACTION (NEW SECTION)

Requirement For Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246)

1. The Contractor's attention is called to the Equal Opportunity Clause and the Standard Federal Equal Employment Opportunity Construction Contract Specifications set forth herein.

2. The goals and timetables for minority and female participation set by the Office of Federal Contract Compliance Programs, expressed in percentage terms for the Contractor's aggregate work force in each construction craft and in each trade on all construction work in the covered area, are as follows:

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Women – Statewide

Timetable	Goal
Until further notice	6.9%

Minorities – by Standard Metropolitan Statistical Area (SMSA)

Seattle, WA:

SMSA Counties:

Seattle Everett, WA 7.2

WA King; WA Snohomish.

Tacoma, WA 6.2

WA Pierce.

Non-SMSA Counties 6.1

WA Clallam; WA Grays Harbor; WA Island; WA Jefferson; WA Kitsap; WA Lewis; WA Mason; WA Pacific; WA San Juan; WA Skagit; WA Thurston; WA Whatcom.

These goals are applicable to each nonexempt Contractor's total on-site construction workforce, regardless of whether or not part of that workforce is performing work on a Federal, or federally assisted project, contract, or subcontract until further notice. Compliance with these goals and time tables is enforced by the Office of Federal Contract compliance Programs.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, in each construction craft and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goal shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Engineer within 10 working days of award of any construction subcontract in excess of $10,000 or more that are Federally funded, at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

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4. As used in this Notice, and in the contract resulting from this solicitation, the Covered Area is as designated herein.

Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246)

1. As used in these specifications:

   a. Covered Area means the geographical area described in the solicitation from which this contract resulted;

   b. Director means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;

   c. Employer Identification Number means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U. S. Treasury Department Form 941;

   d. Minority includes:

      (1) Black, a person having origins in any of the Black Racial Groups of Africa.

      (2) Hispanic, a fluent Spanish speaking, Spanish surnamed person of Mexican, Puerto Rican, Cuban, Central American, South American, or other Spanish origin.

      (3) Asian or Pacific Islander, a person having origins in any of the original peoples of the Pacific rim or the Pacific Islands, the Hawaiian Islands and Samoa.

      (4) American Indian or Alaskan Native, a person having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be

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able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith effort to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of this Special Provision. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative action's to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its action. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

   a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site

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supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore, along with whatever additional actions the Contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunity and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the U.S. Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment

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decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including

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circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through 7p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of the obligations under 7a through 7p of this Special Provision provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensure that the concrete benefits of the program are reflected in the Contractor's minority and female work-force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrate the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspensions, terminations and cancellations of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations by the Office of Federal Contract Compliance Programs. Any

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Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of this Special Provision, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the government and to keep records. Records shall at least include, for each employee, their name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, the Contractors will not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

1-07.11(7) DISADVANTAGED BUSINESS ENTERPRISE CONDITION OF AWARD PARTICIPATION (NEW SECTION)

The Disadvantaged Business Enterprise (DBE) requirements of 49 CFR Part 26 applies to this contract. This goal is considered a condition of award.

DBE Goals

The Contracting Agency has established a goal in the amount of:

_____ percent (__%) of the contract total for DBE goals.

DBE Eligibility

Selection of DBEs

10-20 Submittal - Not for Construction

DBEs proposed by the bidder shall be listed as DBEs on the current list of firms certified by the Office of Minority and Women's Business Enterprises (OMWBE.). In absence of being listed, the Contractor may provide written proof from OMWBE documenting that their proposed DBEs are currently certified. A list of firms certified by OMWBE is available from that office and on line through their website (www.omwb.wa.gov/directory/directory.htm) or by telephone at (360) 704-1181. It shall be the responsibility of the bidder to confirm with OMWBE that the certification of any proposed DBE firm is current and that the firm is certified in the North American Industry Classification System (NAICS) code for the work being proposed. In establishing the certification status of any subcontractor or supplier, the bidder may rely upon the website list or upon any written commitments from OMWBE provided that information is obtained no earlier than 24 hours prior to the time set for bid submittals.

Proposed firms not meeting the specified requirements at the time fixed for the opening of bids will not be credited by the Contracting Agency for the purpose of meeting the goals. The amounts committed to a non-certified firm will not be counted in the evaluation of the bidder's DBE submittal.

In the event that a DBE firm listed is certified at the time of the submission of the bid, but the listed DBE firm is subsequently determined to be ineligible prior to execution of the contract, then the contract execution will proceed and the Contractor will be required to substitute a certified DBE firm for the same amount or to make a good faith effort to do so.

Counting DBE Participation Toward Meeting the Goal and Substitution Requirements

When a DBE participates in a contract, only the value of the work actually performed by the DBE will be counted towards the DBE goal.

1. Count the entire amount of the portion of the contract that is performed by the DBE's own forces. Include the cost of supplies and materials obtained by the DBE for the work of the contract, including supplies purchased or equipment leased by the DBE (except supplies and equipment the DBE Subcontractor purchases or leases from the Prime Contractor or its affiliates, unless the Prime Contractor is also a DBE). Work performed by a DBE, utilizing resources of the Prime Contractor or its affiliates will not be counted toward DBE goals. In very rare situations, a DBE firm may utilize equipment and/or personnel from a non-DBE firm other than the Prime Contractor or its affiliates. Should this situation arise, the arrangement must be short-term and must have prior written approval from the Contracting Agency. The arrangement must not erode a DBE firm's ability to perform a Commercially Useful Function (See discussion of CUF, below).

2. Count the entire amount of fees or commissions charged by a DBE firm for providing a bona fide service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance.

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3. When a DBE subcontracts part of the work of its contract to another firm, the value of the subcontracted work may be counted toward the DBE goal only if the DBE's lower tier Subcontractor is also a DBE. Work that a DBE subcontracts to a non-DBE firm does not count toward the DBE goal. The DBE firm may further subcontract to lower tier subcontractors to the extent specified by Section 1-08.1.

4. When a non-DBE subcontractor further subcontracts to a lower-tier subcontractor or supplier who is a certified DBE, then that portion of the work further subcontracted may be counted toward the DBE goal, so long as it is a distinct clearly defined portion of the work of the subcontract that the DBE is performing in a commercially useful function with its own forces.

5. Continue to count the work subcontracted to a decertified DBE firm after decertification, provided the Prime Contractor had a subcontract in force before the decertification and the Prime Contractor's actions did not influence the DBE's decertification.

DBE Prime Contractor

A DBE prime Contractor may only count the work performed with its own forces and the work performed by DBE Subcontractors and DBE suppliers. In the event that the DBE Prime Contractor becomes decertified during the contract, for reasons other than graduation from the program, the portion of the work performed after the decertification will not count toward the goal. If this work is part of the Condition of Award (COA), the Prime Contractor will be required to meet the Condition of Award and may do so by increasing the dollars and work to another DBE firm in an amount equal to that which cannot be counted, utilize the dollars committed/paid to a non-COA DBE who is already on the project, or make a good faith effort to do so. If the reason for decertification is for graduation, the work of the decertified DBE Prime Contractor may continue to be counted toward the goal.

Joint Venture

When a DBE performs as a participant in a joint venture, only that portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work that the DBE performs with its own forces will count toward the COA DBE goal. In the event that the DBE Joint Venture contractor becomes decertified during the contract, for reasons other than graduation from the program, the portion of the work performed after the decertification will not count toward the DBE goal. If this work is part of the Condition of Award, the Joint Venture will be required to meet the Condition of Award and may do so by increasing the dollars and work to another DBE firm in an amount equal to that which cannot be counted, utilize the dollars committed/paid to a non-COA DBE who is already on the project, or make a good faith effort to do so. If the reason for decertification is for graduation, the work of the decertified DBE Joint Venture contractor may continue to be counted toward the goal.

Changes in the Quantity of Work:

Owner-Initiated Change Orders:

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In the event the Contracting Agency reduces quantities or deletes work items that impact a DBE's work and insufficient work remains on the contract, the Contracting Agency may relieve the Prime Contractor from attainment of that portion of the goal.

Original Quantity Underruns:

In the event that work committed to a DBE firm as part of the COA underruns the original planned quantities and that work is completed according to the contract, the Contractor shall not be required to substitute work for the portion of the COA not achieved.

Contractor-Initiated Proposals – General:

1. Reductions or Deletions

   Any reduction or deletion of Condition of Award DBE work that is proposed by the Contractor under this provision shall not be permitted without the express prior written consent of the Contracting Agency, including concurrence by WSDOT/OEO, which shall have the discretion to deny approval.

   The Contractor must notify and obtain written approval from the Contracting Agency prior to replacing a DBE of making any change in the participation. Approval for replacement will be granted only if it is demonstrated that the DBE is unable or unwilling to perform. The Contractor must make every good faith effort to find another certified DBE subcontractor to substitute for the original DBE. The good faith efforts shall be directed at finding another DBE to perform at least the same amount of work under the contract as the original DBE, to the extent needed to meet the contract goal.

   Any deviation from the DBE condition-of-award letter or contract specifications must be approved by Change Order issued by the Contracting Agency. The Contractor shall notify affected DBEs in writing of any changes in the scope of work which result in a reduction in the dollar amount of condition-of-award to the contract.

   In addition to the above requirements for reductions in the Condition of Award, additional requirements apply to the two cases of Contractor-Initiated work substitution proposals. Where the contract allows alternate work methods which serve to delete or create underruns in condition-of-award DBE work, and the Contractor selects that alternate method or, where the Contractor proposes a substitute work method or material that serves to diminish or delete work committed to a DBE and replace it with other work, then the Contractor must demonstrate one of the following:

   a. That the replacement work will be performed by the same DBE (as long as the DBE is certified in the respective item or work) in a modification or the Condition of Award agreement; or

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b. That the DBE is aware that its work will be deleted or will experience underruns and has agreed in writing to the change. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so; or

c. That the DBE is not capable of performing the replacement work or has declined to perform the work at a reasonably competitive price. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so.

2. Additions

As stated above, any change in the Condition of Award will be evidenced by a Change Order. Where the revision includes work committed to a new DBE subcontractor, not previously involved in the project, then a Request to Sublet shall be submitted in accordance with Section 1-08.1.

If the commitment of work is in the form of additional tasks assigned to an existing subcontractor, then a new Request to Sublet shall not be required. However, the Contractor must document efforts to assure that the existing DBE subcontractor is capable of performing the additional work and has agreed (in writing) to the change.

Commercially Useful Function

Payments to a DBE firm will count toward DBE goals only if the DBE is performing a commercially useful function on the contract.

1. A DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, installing (if applicable) and paying for the material itself. Two party checks are not allowed.

2. A DBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of DBE participation.

Trucking

Use the following factors in determining whether a DBE trucking company is performing a commercially useful function:

1. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is listed on a particular contract.

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2. The DBE must itself own and, with its own workforce, operate at least one fully licensed, insured, and operational truck used on the contract.

3. The DBE receives credit only for the total value of the transportation services it provides on the contract using trucks it owns or leases, licenses, insures, and operates with drivers it employs.

4. For purposes of this paragraph a lease must indicate that the DBE has exclusive use of and control over the truck. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

5. The DBE may lease trucks from another DBE firm and may enter an agreement with an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE or employs a DBE owner-operator receives credit for the total value of the transportation services the lessee DBE provides on the contract.

6. The DBE may also lease trucks from a non-DBE firm and may enter an agreement with an owner-operator who is a non-DBE. The DBE who leases trucks from a non-DBE or employs a non-DBE owner-operator is entitled to credit only for the fee or commission it receives as a result of the lease arrangement. The DBE does not receive credit for the total value of the transportation services provided by the lessee, since these services are not provided by a DBE.

7. In any lease or owner-operator situation, as described in paragraphs 5 & 6 above, the following rules shall apply:

    - A written lease/rental agreement on all trucks leased or rented, showing the true ownership and the terms of the rental must be submitted and approved by the Contracting Agency prior to the beginning of the work. The agreement must show the leaser's name, trucks to be leased, and the agreed upon method of payment (hour, ton, or per load). All lease agreements shall be for a long-term relationship, rather than for the individual project. Does not apply to owner-operator arrangements.

    - Only the vehicle (not the operator) is leased or rented. Does not apply to owner-operator arrangements.

8. In order for DBE project goals to be credited, DBE trucking firms must be covered by a subcontract or a written agreement approved by the Contracting Agency prior to performing their portion of the work

Expenditures Paid to Other DBEs

Expenditures paid to other DBEs for materials or supplies may be counted toward DBE goals as provided in the following:

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Manufacturer:

1. Counting

   If the materials or supplies are obtained from a DBE manufacturer, count 100 percent of the cost of the materials or supplies toward DBE goals.

2. Definition

   To be a manufacturer, the firm operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.

3. In order to receive credit as a DBE manufacturer, the firm must have received an "on-site" review and been approved by WSDOT/OEO to operate as a DBE Manufacturing firm prior to bid opening on any USDOT federally-assisted contract. Use of a DBE manufacturer that has not received an on-site review and approval by WSDOT/OEO prior to bid opening will result in the bid being declared non-responsive. To schedule a review, the manufacturing firm must submit a written request to WSDOT/OEO and may not receive credit towards DBE participation until the completion of the review. Once a firm's manufacturing process has been approved in writing, it is not necessary to resubmit the firm for approval unless the manufacturing process has substantially changed. Information on approved manufacturers (per contract) may be obtained from WSDOT/OEO.

Regular Dealer:

1. Counting

   If the materials or supplies are purchased from a DBE regular dealer, 60 percent of the cost of the materials or supplies will count toward DBE goals.

2. Definition

   a. To be a regular dealer, the firm must own, operate or maintain a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. It must also be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question.

   b. A person may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business, as provided elsewhere in this specification, if the person both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by a long-term lease agreement and not on an ad hoc or contract-by-contract basis.

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c. Packagers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not regular dealers.

3. Regular dealer status is granted on a contract-by-contract basis. To obtain regular dealer status, a formal written request must be made by the interested supplier (potential regular dealer) to WSDOT/OEO. WSDOT/OEO must be in receipt of this request at least seven (7) calendar days prior to bid opening. Included in the request shall be a full description of the project, type of business operated by the DBE, and the manner the DBE will operate as a regular dealer on the specific contract. Rules applicable to regular dealer status are contained in 49 CFR Part 26.55.e.2. Once the request is reviewed by WSDOT/OEO, the DBE supplier requesting it will be notified in writing whether regular dealer status was approved. DBE firms that are approved as regular dealers for a contract (whenever possible) will be listed on the WSDOT Internet Homepage at: www.wsdot.wa.gov/biz/contaa/ prior to the time of bid opening. In addition, bidders may request confirmation of the DBE supplier's approval to operate as a regular dealer on a specific contract by writing the Office of Equal Opportunity, Washington State Department of Transportation, P.O. Box 47314, Olympia, WA 98504-7314 or by phone at (360) 705-7085. Use of a supplier that has not received approval as a regular dealer prior to bid opening will result in the bid being declared nonresponsive. (unless the contribution of the regular dealer was not necessary to meet the project goal).

Materials or Supplies Purchased from a DBE

With respect to materials or supplies purchased from a DBE who is neither a manufacturer nor a regular dealer, the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site may be counted toward the goal. No part of the cost of the materials and supplies themselves may be applied toward DBE goals.

DBE Utilization Certification

To be eligible for award of the contract, the bidder must properly complete and submit a DBE Utilization Certification which has been made a part of the bidder's formal bid proposal. The Certification will be used by the Contracting Agency in determining whether the bidder's proposal satisfies the DBE contract requirements.

For each DBE described in the Certification, the bidder shall state the project role and work item in which the DBE will participate. A general description of the work to be performed by the DBE shall be included. If a DBE will perform a partial item of work, the bidder shall also include a dollar amount for each partial item of work. The bidder shall also include a dollar amount for each DBE listed in the Certification that will be applied toward the assigned DBE contract goal.

In the event of arithmetic errors in completing the Certification, the amount listed to be applied towards the goal for each DBE shall govern and the DBE total shall be adjusted accordingly.

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The information and commitments demonstrated in the Certification shall become a condition of any subsequent award of a contract to that bidder and the Certification itself shall become a part of the subsequent contract.

The Contracting Agency shall consider as non-responsive and shall reject any bid proposal submitted that does not contain a DBE Certification or contains a DBE Certification that fails to demonstrate that the bidder will meet the DBE participation requirements in one of the manners permitted by the contract as described below.

Selection of Successful Bidder/Good Faith Efforts

The successful bidder shall be selected on the basis of having submitted the lowest responsive bid, which demonstrates good faith effort to achieve the goal. Good faith efforts must be provided with the bid proposal. The first step in demonstrating good faith efforts is to document, through the DBE Utilization Certification, that the bidder has obtained enough DBE participation to meet or exceed the assigned DBE goal. If the bidder is unable to meet the goal as demonstrate above, the bidder shall supply documentation in addition to the DBE Utilization Certification of their good faith efforts to meet the DBE assigned contract goal. The additional documentation, if required, must be provided with the bid proposal.

Based upon all of the relevant documentation submitted with the bid, the Contracting Agency shall determine whether the bidder has made a sufficient good faith effort to seek DBE participation. The Contracting Agency will make a fair and reasonable judgment whether a bidder that did not meet the goal made adequate good faith efforts. The quality, quantity, and intensity of the different kinds of efforts that the bidder has made will be considered. A determination will be made whether the efforts employed by the bidder were those one could reasonably expect a bidder to take of the bidder were actively and aggressively trying to obtain DBE participation sufficient to meet the DBE contract goal. Mere pro forma efforts will not be considered to be good faith efforts to meet the DBE contract requirements.

The following is a list of types of actions, which will be considered as part of the bidder's good faith efforts to obtain DBE participation. It is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases:

1. Attendance by the bidder at any pre-solicitation or pre-bid meetings that were scheduled by the Contracting Agency to inform DBEs of contracting and subcontracting or material supply opportunities available on the project;

2. Contacting local Tribes, Tribal Employment Rights Offices (TERO) concerning the subcontracting or supply opportunities in sufficient time to allow the enterprises to participate effectively;

3. Selection by the bidder of specific economically feasible units of the project to be performed by DBEs in order to increase the likelihood of participation by DBEs even if the bidder preferred to perform these work items as the prime contractor;

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4. Advertising by the bidder in general circulation, trade association minority and trade oriented, women focused publications, concerning the subcontracting or supply opportunities;

5. Providing written notice from the bidder to a reasonable number of specific DBEs, identified from the OMWBE Directory of Certified Firms for the selected subcontracting of material supply work, in sufficient time to allow the enterprises to participate effectively;

6. Follow-up by the bidder of initial solicitations of interest by contacting the DBEs to determine with certainty whether they were interested. Documentation of this kind of action may include the information outlined below:

    a. The names, addresses, telephone numbers of DBEs who were contacted, the dates of initial contact, and whether initial solicitations of interest were followed-up by contacting the DBEs to determine with certainty whether the DBEs were interested;

    b. A description of the information provided to the DBEs regarding the plans, specifications, and estimated quantities for portions of the work to be performed;

    c. Documentation of each DBE contacted but rejected and the reason(s) for that rejection;

7. Providing, to interested DBEs, adequate information about the plans, specifications, and requirements for the selected subcontracting or material supply work;

8. Negotiating in good faith with the DBE firms, and not, without justifiable reason, rejecting as unsatisfactory, bids that are prepared by any DBE;

9. Advertising and making efforts to obtain DBE participation that were reasonably expected to produce a level of participation sufficient to meet the goal or requirements of the Contracting Agency;

10. Making any other efforts to obtain DBE participation that were reasonably expected to produce a level of participation sufficient to meet the goal or requirements of the Contracting Agency;

11. Using the services of minority community organizations, minority contractor groups, local, state, and federal minority business assistance offices and other organizations identified by WSDOT and advocates for disadvantaged, minority, and women businesses that provide assistance in the recruitment and placement of disadvantaged, minority, and women business enterprises; and

12. Using DBE Supportive Services by contacting the Office of Minority and Women's Business Enterprises DBE Supportive Services Offices:

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Seattle: (206) 553-7356
Tacoma: (253) 680-7393

If, after review of the documentation provided in the bidder's proposal, the Contracting Agency determines that a good faith effort was made to secure DBE participation, the assigned DBE goal will not be reduced to the bidder's partial commitment. However, the bidder will be formally advised in the award letter that the partial commitment will satisfy the terms of the contract and there will be no adverse effect on the Contractor as a result of the reduced attainment.

Should the low and otherwise responsive bidder fail to meet the DBE participation requirements in one of the manners provided in the proposed contract, its bid proposal will be rejected as non-responsive and the next lowest responsive bid accepted unless the Contracting Agency chooses to reject all bids.

Administrative Reconsideration:

1. A bidder has the right to reconsideration in the event its bid been found to be non-responsive due to a failure to meet the requirements of this specification. The bidder must request reconsideration within five working days of notification of being non-responsive or forfeit the right to reconsideration.

2. The Contracting Agency's decision on reconsideration shall be made by an official who did not take part in the original determination that the bidder failed to meet the goal or make adequate good faith efforts to do so.

3. The bidder shall have the opportunity to meet in person with the official for the purpose of setting forth the bidder's position as to why its bid proposal met the DBE contract requirements. The bidder's support for its position must be based on its bid submittal. The bidder may provide further explanation/clarification of the information and materials in the submittal, but no new materials of information will be considered by the official in reaching a decision on reconsideration.

4. The official shall send the bidder a written decision on reconsideration, explaining the basis for the finding as to whether the bidder's bid submittal met the DBE contract requirements.

The Contracting Agency has been advised that the United Stated Department of Transportation will not accept appeals concerning results of the reconsideration process.

Procedures Between Award and Execution

After award of the contract, the successful bidder shall provide the additional information described below. A failure to comply shall result in the forfeiture of the bidder's proposal bond or deposit.

The Contracting Agency will notify the successful bidder of the award of the contract in writing and will include a request for a further breakdown of the DBE information. After award and prior to execution of the contract, the bidder shall submit the following items:

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1. Additional information for all successful DBEs as shown on the DBE Utilization Certification.

    - Correct business name, federal employee identification number (if available), and mailing address.
    - List of all bid items assigned to each successful DBE firm, including unit prices and extensions.
    - Description of partial items (if any) to be sublet to each successful DBE firm specifying the distinct elements of work under each item to be performed by the DBE and including the dollar value of the DBE portion.

    Total amounts shown for each DBE shall not be less than the amount shown on the Utilization Certification. This submittal, showing the DBE work item breakdown, when accepted by the Contracting Agency and resulting in contract execution, shall become a part of the contract. A breakdown that does not conform to the DBE Utilization Certification or that demonstrates a lesser amount of DBE participation than that included in the Certification will be returned for correction. The Contract will not be executed by the Contracting Agency until a satisfactory breakdown has been submitted. A breakdown that conforms to the DBE Utilization Certification but demonstrates a greater total amount of participation than that included in the Certification will be accepted and the Condition of Award will be adjusted accordingly

2. A list of all firms who submitted a bid or quote in an attempt to participate in this project whether they were successful or not. Include the correct business name, federal employer identification number (optional), and a mailing address.

    The firms identified by the Contractor may be contacted to solicit general information as follows:

    1. Age of the firm
    2. Average of its gross annual receipts over the past three years

Procedures After Execution

Reporting

The Contractor shall submit a "Quarterly Report of Amounts Credited as DBE Participation" (actual payments) on a quarterly basis for any calendar quarter in which DBE work is accomplished or upon completion of the project, as appropriate. The quarterly reports are due on January 20th, April 20th, July 20th, and October 20th of each year. The dollars reported will be in accordance with the "Counting DBE Participation" section of this specification.

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In the event that the payments to a DBE have been made by an entity other than the Prime Contractor (as in the case of a lower-tier subcontractor or supplier), then the Prime Contractor shall obtain the quarterly report, including the signed affidavit, from the paying entity and submit the report to the Contracting Agency.

Damages for Noncompliance

When a Contractor violates the DBE provisions of the contract, the Contracting Agency may incur damages. These damages consist of additional administrative costs including, but not limited to, the inspection, supervision, engineering, compliance, and legal staff time and expenses necessary for investigating, reporting, and correcting violations as well as loss of federal funding. Damages attributable to a Contractor's violations of the DBE provisions may be deducted from progress payments due to the Contractor or from retainage withheld by the Contracting Agency as allowed by RCW 60.28.021. Before any money is withheld, the Contractor will be provided with a notice of the basis of the violations and an opportunity to respond.

The Contracting Agency's decision to recover damages for a DBE violation does not limit its ability to suspend or revoke the Contractor's pre-qualification status or seek other remedies as allowed by federal or state law. In appropriate circumstances, the Contracting Agency may also refer the Contractor to state or federal authorities for additional sanctions.

Required Disadvantaged Business Enterprise Provisions

The Contractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of contracts, which contain funding assistance from the United States Department of Transportation. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Contracting Agency deems appropriate.

If the Contractor does not comply with any part of its contract as required under 49 CFR Part 26, and/or any other applicable law or regulation regarding DBE, the Contracting Agency may withhold payment, suspend, or terminate the contract, and subject the Contractor to civil penalties of up to ten percent of the amount of the contract for each violation. In the case of WSDOT contracts, repeated violations, exceeding a single violation, may disqualify the Contractor from further participation in WSDOT contracts for a period of up to three years. An apparent low bidder must be in compliance with these contract provisions as a condition precedent to the granting of a notice of award by the Contracting Agency. The Contractor is entitled to request an adjudicative proceeding with respect to the Contracting Agency's determination of contract violation and assessed penalties by filing a written application within thirty days of receipt of notification. The adjudicative proceeding, if requested, will be conducted by an administrative law judge pursuant to the procedures set forth in RCW 34.05 and Chapter 10.08 of the Washington Administrative Code.

Payment

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Compensation for all costs involved with complying with the conditions of this specification and any associated DBE requirements is included in payment for the associated contract items of work.

1-07.11(8) SPECIAL TRAINING PROVISIONS (NEW SECTION)

General Requirements

The Contractor's equal employment opportunity, affirmative action program shall include the requirements set forth below. The Contractor shall provide on-the-job training aimed at developing trainees to journeyman status in the trades involved. The number of training hours shall be _____. The training program shall assign a minimum of 200 hours per trainee. The Contractor may elect to accomplish training as part of the work of a subcontractor, however, the Prime Contractor shall retain the responsibility for complying with these Special Provisions. The Contractor shall also ensure that this training provision is made applicable to any subcontract that includes training.

Trainee Approval

The Federal government requires Contracting Agencies to include these training provisions as a condition attached to the receipt of Federal highway funding. The Federal government has determined that the training and promotion of members of certain minority groups and women is a primary objective of this training provision. The Contractor shall make every effort to enroll minority groups and women trainees to the extent such persons are available within a reasonable recruitment area. This training provision is not intended and shall not be used to discriminate against any applicant for training, whether that person is a minority, woman or otherwise. A non-minority male trainee or apprentice may be approved provided the following requirements are met:

1. the Contractor is otherwise in compliance with the contract's Equal Employment Opportunity and On-the-Job Training requirements and provides documentation of the efforts taken to fill the specific training position with either minorities or females

2. or, if not otherwise in compliance, furnishes evidence of his/her systematic and direct recruitment efforts in regard to the position in question and in promoting the enrollment and/or employment of minorities and females in the craft which the proposed trainee is to be trained

3. and the Contractor has made a good faith effort towards recruiting of minorities and women. As a minimum this good faith effort shall consist of the following:

    - Distribution of written notices of available employment opportunities with the Contractor and enrollment opportunities with its unions. Distribution should include but not be limited to; minority and female recruitment sources and minority and female community organizations;

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- Records documenting the Contractor's efforts and the outcome of those efforts, to employ minority and female applicants and/or refer them to unions;
- Records reflecting the Contractor's efforts in participating in developing minority and female on-the-job training opportunities, including upgrading programs and apprenticeship opportunities;
- Distribution of written notices to unions and training programs disseminating the Contractor's EEO policy and requesting cooperation in achieving EEO and OJT obligations.

No employee shall be employed as a trainee in any classification in which the employee has successfully completed a training course leading to journeyman status or in which the employee has been employed as a journeyman. The Contractor's records shall document the methods for determining the trainee's status and findings in each case. When feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

For the purpose of this specification, acceptable training programs are those employing trainees/apprentices registered with the following:

1. Washington State Department of Labor & Industries — State Apprenticeship Training Council (SATC) approved apprenticeship agreement:

   a. Pursuant to RCW 49.04.060, an apprenticeship agreement shall be;

      i. an individual written agreement between an employer and apprentice

      ii. a written agreement between (an employer or an association of employers) and an organization of employees describing conditions of employment for apprentices

      iii. a written statement describing conditions of employment for apprentices in a plant where there is no bona fide employee organization.

   All such agreements shall conform to the basic standards and other provisions of RCW Chapter 49.

2. Apprentices must be registered with U.S. Department of Labor — Bureau of Apprenticeship Training (BAT) approved program.

   Or

3. Trainees participating in a non-BAT/SATC program, which has been approved by the Contracting Agency for the specific project.

4. For assistance in locating trainee candidates, the Contractor may call WSDOT's OJT Support Services Technical Advisor at (360) 705-7088, (206) 587-4954 or toll free at 1-866-252-2680.

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Obligation to Provide Information

Upon starting a new trainee, the Contractor shall furnish the trainee a copy of the approved program the Contractor will follow in providing the training. Upon completion of the training, the Contractor shall provide the Contracting Agency with a certification showing the type and length of training satisfactorily completed by each trainee.

Training Program Approval

The Training Program shall meet the following requirements:

1. The Training Program (DOT Form 272-049) must be submitted to the Engineer for approval prior to commencing contract work and shall be resubmitted when modifications to the program occur.

2. The minimum length and type of training for each classification will be as established in the training program as approved by the Contracting Agency.

3. The Training Program shall contain the trades proposed for training, the number of trainees, the hours assigned to the trade and the estimated beginning work date for each trainee.

4. Unless otherwise specified, Training Programs will be approved if the proposed number of training hours equals the training hours required by contract and the training program assigns a minimum of 200 hours per trainee.

5. After approval of the training program, information concerning each individual trainee and good faith effort documentation shall be submitted on (DOT Form 272-050.)

6. In King County, laborer trainees or apprentices will not be approved on contracts containing less than 1000 training hours as specified in this Section. In King County, no more than twenty percent (20%) of hours proposed for trainees or apprentices shall be in the laborer classification when the contract contains 1000 or more hours of training as specified in this Section. The training program shall assign a minimum of 200 hours per trainee.

7. Flagging programs will not be approved. Other programs that include flagging training will only be approved if the flagging portion is limited to an orientation of not more than 20 hours.

8. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Some off-site training is permissible as long as the training is an integral part of an approved training program.

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9. It is normally expected that a trainee will begin training on the project as soon as feasible after start of work, utilizing the skill involved and remain on the project as long as training opportunities exist in the work classification or upon completion of the training program. It is not required that all trainees be on board for the entire length of the contract. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

10. Wage Progressions: Trainees will be paid at least the applicable ratios or wage progressions shown in the apprenticeship standards published by the Washington State Department of Labor and Industries. In the event that no training program has been established by the Department of Labor and Industries, the trainee shall be paid in accordance with the provisions of RCW 39.12.021 which reads as follows:

> Apprentice workmen employed upon public works projects for whom an apprenticeship agreement has been registered and approved with the State Apprenticeship Council pursuant to RCW 49.04, must be paid at least the prevailing hourly rate for an apprentice of that trade. Any workman for whom an apprenticeship agreement has not been registered and approved by the State Apprenticeship Council shall be considered to be a fully qualified journeyman, and, therefore, shall be paid at the prevailing hourly rate for journeymen.

Compliance

In the event that the Contractor is unable to accomplish the required training hours but can demonstrate a good faith effort to meet the requirements as specified, then the Contracting Agency will adjust the training goals accordingly.

Requirements for Non BAT/SATC Approved Training Programs

Contractors who are not affiliated with a program approved by BAT or SATC may have their training program approved provided that the program is submitted for approval on DOT Form 272-049, and the following standards are addressed and incorporated in the Contractor's program:

- The program establishes minimum qualifications for persons entering the training program.
- The program shall outline the work processes in which the trainee will receive supervised work experience and training on-the-job and the allocation of the approximate time to be spent in each major process. The program shall include the method for recording and reporting the training completed shall be stated.
- The program shall include a numeric ratio of trainees to journeymen consistent with proper supervision, training, safety, and continuity of employment. The ratio language shall be specific and clear as to application in terms of job site and workforce during normal operations (normally considered to fall between 1:10 and 1:4).

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- The terms of training shall be stated in hours. The number of hours required for completion to journeyman status shall be comparable to the apprenticeship hours established for that craft by the SATC. The following are examples of programs that are currently approved:

CRAFT	HOURS
Laborer	4,000
Ironworker	6,000
Carpenter	5,200-8,000
Construction Electrician	8,000
Operating Engineer	6,000-8,000
Cement Mason	5,400
Teamster	2,100

- The method to be used for recording and reporting the training completed shall be stated.

- A numeric ratio of trainees to journeymen shall be established. It shall be consistent with proper supervision, training, safety and continuity of employment. The ratio language shall be specific and clear as to application in terms of job site and workforce during normal operations.

Measurement

The Contractor may request that the total number of "training" hours for the contract be increased subject to approval by the Contracting Agency. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other sources do not prohibit other reimbursement. Reimbursement to the Contractor for off-site training as indicated previously may only be made when the Contractor does one or more of the following and the trainees are concurrently employed on a Federal-aid project:

- contributes to the cost of the training,

- provides the instruction to the trainee,

- pays the trainee's wages during the off- site training period.

Reimbursement will be made upon receipt of a certified invoice that shows the related payroll number, the name of trainee, total hours trained under the program, previously paid hours under the contract, hours due this estimate, and dollar amount due this estimate. The certified invoice shall show a statement indicating the Contractor's effort to enroll minorities and women when a

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new enrollment occurs. If a trainee is participating in a SATC/BAT approved apprenticeship program, a copy of the certificate showing apprenticeship registration must accompany the first invoice on which the individual appears. Reimbursement for training occurring prior to approval of the training program will be allowed if the Contractor verbally notifies the Engineer of this occurrence at the time the apprentice/trainee commences work. A trainee/apprentice, regardless of craft, must have worked on the contract for at least 20 hours to be eligible for reimbursement.

Payment

The Contractor will be reimbursed under the item "Training" per hour for each hour of training for each employee.

1-07.12(1) REQUIRED FEDERAL AID PROVISIONS (NEW SECTION)

The Required Contract Provisions Federal Aid Construction Contracts (FHWA 1273) and the amendments thereto supersede any conflicting provisions of the Standard Specifications and are made a part of this contract; provided, however, that if any of the provisions of FHWA 1273, as amended, are less restrictive than Washington State Law, then the Washington State Law shall prevail.

The provisions of FHWA 1273, as amended, included in this contract require that the Contractor insert the FHWA 1273 and amendments thereto in each subcontract, together with the wage rates which are part of the FHWA 1273, as amended. Also, a clause shall be included in each subcontract requiring the subcontractors to insert the FHWA 1273 and amendments thereto in any lower tier subcontracts, together with the wage rates. The Contractor shall also ensure that this section, REQUIRED FEDERAL AID PROVISIONS, is inserted in each subcontract for subcontractors and lower tier subcontractors. For this purpose, upon request to the Project Engineer, the Contractor will be provided with extra copies of the FHWA 1273, the amendments thereto, the applicable wage rates, and this Special Provision.

1-07.13(1) GENERAL

The following is inserted at the end of this section:

King County reserves the right to use and occupy any portion of this improvement which has been completed sufficiently to permit use and occupancy and such use shall not be construed as an acceptance of the work or any part thereof, and any claims which King County may have against the Contractor shall not be deemed to have been waived by such occupancy.

1-07.14 RESPONSIBILITY FOR DAMAGE

This Section is deleted in its entirety and replaced with the following:

The Contractor shall protect, defend, indemnify, and save harmless the County, its officers, officials, employees, and agents, from any and all claims, demands, suits, penalties, losses, damages, judgments, or costs of any kind whatsoever (hereinafter "claims"), arising out of or in any way resulting from the Contractor's officers, employees, agents, and/or subcontractors of all

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tiers, acts or omissions, performance or failure to perform this Contract, to the maximum extent permitted by law or as defined by RCW 4.24.115, now enacted or as hereinafter amended.

The Contractor's obligations under this section shall include, but not be limited to

1. The duty to promptly accept tender of defense and provide defense to the County at the Contractor's own expense

2. The duty to indemnify and defend the County from any claim, demand, and/or cause of action brought by or on behalf of any of its employees, or agents. The foregoing duty is specifically and expressly intended to constitute a waiver of the Contractor's immunity under Washington's Industrial Insurance Act, RCW Title 51, as respects the County with a full and complete indemnity and defense of claims made by the Contractor's employees. The parties acknowledge that these provisions were mutually negotiated and agreed upon by them.

3. To the maximum extent permitted by law, the Contractor shall indemnify and defend the County from and be liable for all damages and injury which shall be caused to owners of property on or in the vicinity of the work or which shall occur to any person or persons or property whatsoever arising out of the performance of this Contract, whether or not such injury or damage is caused by negligence of the Contractor or caused by the inherent nature of the work specified.

King County may, in its sole discretion, (1) withhold amounts sufficient to pay the amount of any claim for injury, and/or (2) pay any claim for injury of which King County may have knowledge, regardless of the formalities of notice of such claim, arising out of the performance of this Contract.

An amount withheld will be held until the Contractor secures a written release from the claimant, obtains a court decision that such claim is without merit, or satisfies any judgment on such claim. In addition, the Contractor shall reimburse and otherwise be liable for claims costs incurred by King County, including, without limitation, costs for claims adjusting services, attorneys, engineering, and administration.

In the event the County incurs any judgment, award, and/or costs arising, including attorneys' fees, from enforcing the provisions of this provision, all such fees, expenses, and costs shall be recoverable from the Contractor.

1-07.15(1) SPILL PREVENTION, CONTROL AND COUNTERMEASURES PLAN

The following is added at the end of this section:

In the event of a spill, the Contractor shall immediately notify the engineer. The Contractor shall address the following items in the SPCC Plan in addition to the requirements of Section 1-07.15(1):

Mixing, Transfers, & Storage

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1. All oil, fuel or chemical storage tanks or containers shall be diked and located on impervious surfaces so as to prevent spill from escaping.
2. All liquid products shall be stored and mixed on impervious surfaces in a secure water tight environment and provide containment to handle the maximum volume of liquid products on site at any given time.
3. Proper security shall be maintained to prevent vandalism.
4. Drip pans or other protective devices shall be required for all transfer operations.

Spills

Paint and solvent spills shall be treated as oil spills and shall be prevented from reaching storm drains or other discharges. No cleaning solvents or chemicals used for tool or equipment cleaning may be discharged to the ground or water.

Contractor shall have a spill prevention plan including, a containment plan. The spill prevention plan shall be kept on-site and ready for use. All equipment shall be inspected and maintained in proper working condition within the project site. Any equipment leaking fluids, shall not be allowed near the river and must be repaired immediately and before further use.

There shall be no visible sheen of petroleum products in receiving water as a result of construction activities.

Maintenance of Equipment

Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc, shall be checked regularly for drips or leaks and shall be maintained and stored properly to prevent spills into State waters.

Equipment that is used for in-water work and over-water work shall be cleaned prior to operations. External oil and grease shall be removed, along with dirt and mud. No untreated wash and/or rinse water shall be discharged into the waterway.

All construction equipment working in the water shall use vegetable-based hydraulic fluid.

All vehicles operated within 150 feet of the waterway shall be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected will be repaired before the vehicle resumes operation. When not in use, vehicles shall be stored in a designated vehicle staging area.

Drip pans shall be fitted with absorbent pads and placed under all equipment being fueled. Fueling shall not occur over or within the river/water area. Fueling shall be performed in a defined area outside of the river/water area and be equipped with containment appurtenances.

Disposal

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Spilled waste, chemicals or petroleum products shall be transported off site for disposal at a facility approved by the Department of Ecology. The materials shall not be discharged to any sanitary sewer without approval of the local sewer authority.

Discharge of petroleum products, hydraulic fluid, fresh cement, sediment-laden water, chemicals, or any other toxic or deleterious materials leaching or entering into surface runoff or the river, is prohibited. Any discharge of this kind shall immediately be reported to the Engineer.

Reporting and Cleanup

The Contractor's designated person for managing and implementing the SPCC Plan shall report hazardous material spills as follows:

Spills into State water (including ponds, ditches, seasonally dry streams, and wetlands) – Immediately call all of the following:

National Response Center	1-800-424-8802
WA State Div. of Emergency Management (24 hr)	1-800-258-5990
Ecology Northwest Regional Office	1-425-649-7000

Spill to Soil (Including encounters of pre-existing contamination):

Ecology Northwest Regional Office	1-425-649-7000

Report immediately if threatening to health or environment (i.e., explosive, flammable, toxic vapors, shallow groundwater, nearby creek), otherwise within 90 days

Underground Storage Tank (confirmed release of material)

Ecology Northwest Regional Office	1-425-649-7000

Report within 24 hours

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1-07.16 PROTECTION AND RESTORATION OF PROPERTY

The following is inserted at the beginning of this section:

Abandon Monitoring Well

The Contractor shall abandon monitoring well at the locations as shown in the Plans and in accordance with the Washington State Department of Ecology regulations WAC 173-160-450 and 460. This work shall be completed prior to clearing, grubbing, grading or other activities.

1-07.16(1) PRIVATE/PUBLIC PROPERTY

The first sentence of the second paragraph is revised as follows:

The Contractor shall protect private or public property on or in the vicinity of the Work site, including but not limited to Boeing Building 2-41, Boeing Building 2-31 and the boat ramp on the south bank of the Duwamish Waterway east of the existing bridge.

The following is inserted at the end of this section:

Existing survey monuments and utility covers shall be protected during the paving operation. Following the paving operation, the Contractor shall make a small depression in the asphalt mat over the cover and paint the area with silver spray paint. All costs and expense incurred for this operation shall be incidental to the various items of the project and no further compensation will be made.

The Contractor is responsible for the establishment and maintenance of all Right of Way monumentation. Removal or destruction of monuments will not be allowed until the Engineer has witness monuments in place to perpetuate the position of the pre-existing monument. The Contractor performing Work that includes the destruction or removal (even temporarily) of monuments shall at least four (4) working days in advance of monument removal or destruction, forward a copy of the initial DNR permit (Ch 332-120 WAC) to the Engineer. Within five (5) working days after remonumentation, the Contractor shall notify the Engineer and shall forward a copy of the follow-up DNR permit addressing remonumentation to the Engineer.

All cost to remonument removed or destroyed monumentation without making the required notification, and without providing copies of both the initial and follow-up DNR permit as required in this Section, shall be at the sole expense of the Contractor. Such cost shall include, but is not limited to replacement survey, survey supervision, remonumentation, necessary documentation and verification, and other direct expense to the Owner.

1-07.16(1)A BUILDING CONDITION SURVEY (NEW SECTION)

Description: The Contractor shall conduct pre-construction, predemolition (existing bridge), and post-construction surveys of Boeing Buildings 2-10, 2-41 and 2-31, as well as the South Park Marine Building and houses or buildings within 100 feet of pile installation activities located on private property. The pre-construction survey is intended to provide a baseline record of the preconstruction condition of the site, buildings and houses against which the effects of construction activities can be assessed. The Contractor shall employ an independent third party surveyor regularly engaged in the business of evaluating building conditions and performing work of similar nature. Qualifications shall be submitted to the Engineer for review, prior to authorization of work. Representative(s) from the construction management team will accompany the Contractor during the pre-construction, pre-demolition and post-construction surveys.

Coordination with Building Owners: The Engineer will coordinate with the building owners to arrange for the pre-construction, pre-demolition and post-construction surveys. The Contractor shall coordinate with the Engineer to perform these surveys.

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Condition Survey: The Contractor shall document the preconstruction and pre-demolition condition of the site and buildings with photographs, videotape, and a report of findings. This survey shall document the existing exterior and interior conditions of buildings as well as the condition of the surrounding site and pile foundations. The building survey shall document the characteristics of the piling, floor slab, structural framing, glazing, brickwork, adjacent soils and tidal water conditions.

The survey shall include documentation of accessible interior walls, ceilings, floors and roof. The survey shall detail, by engineering sketches, videotape, digital photographs, the existing structural, cosmetic, plumbing, and electrical damage, but will not necessarily be limited to areas in buildings showing existing damage. Lighting used in conjunction with videotapes and photos shall be of sufficient brightness and quality to show details of existing conditions.

Preconstruction Notification of Existing Conditions: The Contractor shall immediately report any existing damage or faulty condition to the Engineer, prior to construction or demolition. Once demolition or construction activities have commenced it shall be assumed that all damages not previously reported by the Contractor have been caused by the Contractor's operations.

Photography: Photography shall consist of digital images with a minimum resolution of five mega pixels. Indicate on each photograph the date, name of work, and location of where the photograph was taken and direction facing. Provide a catalog of digital photographs on Compact Discs (CDs). Provide proof sheets of the photography consisting of color thumbnail views of the photographs contained on each CD. Provide a minimum of 50 digital photographs each of the preconstruction, pre-demolition and post-construction conditions.

Videotape Survey: Provide approximately 45 minutes of videotape survey each of the pre-construction, pre-demolition and post-construction conditions. Include time stamp and narrative explaining locations and other pertinent details such as existing condition of the items being shown.

Crack Monitoring: Up to ten crack displacement monitoring gages shall be installed at existing cracks identified and/or as directed by the Engineer as appropriate in buildings to help verify distress if any should develop. Crack monitoring gages shall be read daily during construction and demolition activities in close proximity to the building and weekly thereafter. Results of this monitoring shall be submitted to the Engineer within two days of the monitoring.

Post-Construction Field Inspection: Upon completion of all construction activities and bridge demolition , the Contractor shall contact the Engineer to make arrangements for a post-construction survey to be performed by the Contractor's third party condition surveyor, with representatives of the building owners to confirm that no damages to the building have occurred, or that all damages caused by the Contractor's operations have been repaired to the owners satisfaction. The Contractor shall demonstrate resolution of damage claims from building owners by written minutes of a post-construction conference with building owners.

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Deliverable Products: The Contractor shall develop and submit preconstruction, pre-demolition and post-construction building condition survey reports of findings. Each report shall contain but is not limited to the following:

1. Independent third party surveyor's hand-written notes.
2. Independent third party surveyor's audio notes on tape.
3. Digital color photographs and digital videos depicting the interior and exterior of the building.
4. Crack monitoring data.
5. Independent third party surveyor's inspection forms.

Each report shall summarize the condition of the buildings surveyed and give details of areas of concern. Three copies each of the preconstruction, pre-demolition and post-construction building condition survey reports shall be submitted to the Engineer. The preconstruction building survey report shall be provided no later than fourteen (14) calendar days prior to the initial start of any site construction. The pre-demolition building condition survey shall be provided no later than fourteen (14) calendar days prior to the start of existing bridge demolition activity.

The above provisions do not relieve the Contractor of any responsibility for damage caused by his operations nor do they relieve the Contractor from compliance with all other applicable federal, state, county and city codes relative to construction practices.

Measurement

Measurement of the work associated with "Building Condition Survey" will not be measured but will paid for on a lump sum basis.

Payment

"Building Condition Survey", lump sum.

The lump sum Contract price for "Building Condition Survey" shall be full pay for all costs in connection with furnishing all materials, labor, tools, and equipment necessary for the development, coordination, transportation, equipment, supplies and labor of all building condition surveys.

1-07.16(4) ARCHAEOLOGICAL AND HISTORICAL OBJECTS

The following is inserted at the end of this section:

(December 6, 2004)

The project area potentially contains archaeological or historical objects that may have significance from a historical or scientific standpoint. To protect these objects from damage or destruction, the Contracting Agency, at its discretion and expense, may monitor the Contractor's

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operations, conduct various site testing and perform recovery and removal of such objects when necessary.

The Contractor may be required to conduct its operations in a manner that will accommodate such activities, including the reserving of portions of the work area for site testing, exploratory operations and recovery and removal of such objects as directed by the Engineer. If such activities are performed by consultants retained by the Contracting Agency, the Contractor shall provide them adequate access to the project site.

Added work necessary to uncover, fence, dewater, or otherwise protect or assist in such testing, exploratory operations and salvaging of the objects as ordered by the Engineer shall be paid by force account as provided in Section 1-09.6. If the discovery and salvaging activities require the Engineer to suspend the Contractor's work, any adjustment in time will be determined by the Engineer pursuant to Section 1-08.8.

To provide a common basis for all bidders, the Contracting Agency has entered an amount for the item "Archaeological and Historical Salvage" in the Proposal to become a part of the total bid by the Contractor.

1-07.16(5) PAYMENT

The following is added at the end of this section:

No specific unit of measure will apply to the abandonment of monitoring wells. Payment will be made in accordance with Section 1-04.1 for:

"Abandon Monitoring Well", lump sum.

The lump sum contract price for "Abandon Monitoring Well" shall be full pay for performing the work as specified including meeting the requirements of WAC 173-160-450 and 460, and removing and disposing of all casings and casing pipe from the project limits.

1-07.17 UTILITIES AND SIMILAR FACILITIES

The following is inserted at the end of this section:

Locations and dimensions shown in the Plans for existing facilities are in accordance with available information obtained without uncovering, measuring or other verification. The Contractor shall attend a mandatory utility preconstruction meeting with the Engineer, all affected subcontractors, and all utility owners and their contractors prior to beginning onsite work.

The following addresses and telephone numbers of utility companies known or suspected of having facilities within the project limits are supplied for the Contractor's convenience:

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Seattle City Light
3613 Fourth Avenue South
SSC Building A-214
Seattle, WA 98134

Attn: Percy Schlimm

Tel: 206-386-4246
E-mail: Percy.Schlimm@seattle.gov

Seattle Public Utilities
Seattle Municipal Tower
700 Fifth Avenue, Suite 4900
Seattle, WA 98124

Attn: Richard Smith

Tel: (206) 684-5012
E-mail: Richard.Smith@seattle.gov

Comcast
4020 Auburn Way N
Auburn, WA 98002

Attn: Gary Cook

Tel: 206-510-1337
E-mail: Gary_Cook@cable.comcast.com

Puget Sound Energy
PO Box 90868
Bellevue, WA 98009

Attn: Kathy Johnson

Tel: 425-462-3381
Cell: 206-240-2482
E-mail: Kathy.Johnson@pse.com

Qwest
23315 – 66th Ave S
Kent, WA 98032

Attn: Herb Sumner

Tel: 206-345-4475
E-mail: Herb.Sumner@qwest.com

The Boeing Company
P.O. Box 3707
M/C 67-12
Seattle, WA 98124

Attn: Chuck Waller

Tel: 206-713-2586
E-mail: Chuck.Waller@boeing.com

The Boeing Company
800 North 6th Street
M/S 9U-LW
Renton, WA 98055

Attn: Barbara Holden

Tel: 206-714-7420
E-mail: Barbara.Holden@boeing.com

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1-07.17(3) UTILITY CLEARANCES

1-07.17(3)A VACANT

1-07.17(3)B CLEARANCES BETWEEN STORM DRAIN AND OTHER UTILITIES (NEW SECTION)

Whenever a new Storm Drain clears an existing or new Sewer or Utility by 6-inch or less, polyethylene plastic foam (see Section 9-05.10B) shall be placed between the pipes as a cushion prior to backfilling. Whenever a new Storm Drain is within 18-inches or less of new or existing

Sewer the Storm Drain shall be a standard single 18-foot nominal length ductile iron section centered at point of crossing.

1-07.17(3)C VACANT

1-07.17(3)D GAS MAIN CLEARANCES WITH HEAT GENERATING UTILITIES AND NON-HEAT GENERATING UTILITIES (NEW SECTION)

Heat generating facilities shall include electrical distribution and transmission including grounds, steam facilities, and other heat generating sources.

Non-heat generating utilities clearance requirements:

1. For high-pressure gas main and service lateral, and for gas transmission line:

    a. If a utility is parallel to the gas facility, then horizontal clearance shall be at least three (3) feet.

    b. If a utility crosses over or under the gas facility, then vertical clearance shall be at least three (3) feet.

B. For non-high pressure gas main and service lateral, and for other than gas transmission line:

    a. If a utility is parallel to the gas facility, then horizontal clearance shall be at least one (1) foot.

    b. If a utility crosses over or under the gas facility, then vertical clearance shall be at least six (6) inch.

In no case, shall any utility make contact of any kind with a gas facility.

1-07.17(3)E TREE CLEARANCES (NEW SECTION)

Planting of new trees shall meet the tree clearance requirements specified on City of Seattle Drawing number 030 in the Appendix.

1-07.17(3)F STANDARD LOCATION FOR UTILITIES – RESIDENTIAL STREET (NEW SECTION)

Utilities located on residential streets shall meet the location standards and clearances specified on City of Seattle Drawing number 030 in the Appendix.

1-07.17(2) UTILITY CONSTRUCTION, REMOVAL OR RELOCATION BY OTHERS

The following is added at the end of this section:

Throughout the duration of this project, The Boeing Company (Boeing) will perform other work at or near the site, including any material site, with other forces than those of the Contractor. If such work takes place within or next to this project, the Contractor shall coordinate its work with

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all other contractors or forces. The Contractor shall carry out work under this project in a way that will minimize interference and delay for all forces involved. The Engineer will resolve any disagreements that may arise among the contractors or the Contractor and the Contracting Agency over the method or order of work. The Engineer's decision in these matters shall be final, as provided in Section 1-05.1

The coordination of the work shall be taken into account by the Contractor as part of the site investigation in accordance with Section 1-02.4 and any costs incurred by the Contractor resulting from the coordination for prosecution of the work regarding utility adjustment, relocation, replacement or construction including any delay to the Contractor's work schedule shall be at the Contractor's expense.

It is anticipated that the following work will be performed by others immediately prior to the construction of this project or during the course of this Project:

Fiber Optic Conduit

The Boeing Company and/or subcontractor will install Fiber Optic Conduit as shown in Plans (UT05 & UT06) that will cross the Project and north staging area from approximate SPB Station 37+00 to Station 42+00. The work includes installing a conduit duct bank, vaults or manholes and routing communication cables through new duct bank and manholes. The Contractor shall allow access for other contractors or forces to manholes and accommodate their requirements of schedule, material laydown and safety in order for them to complete their work expediently.

Gas Service

The Boeing Company, Puget Sound Energy and/or subcontractor will install gas line as shown in Plans (UT07) that will cross the Project at approximate SPB Station 45+00 and onto Boeing property where it may conflict with this project's access. The proposed 8-inch gas line is planned to be installed at a depth to match the existing gas main. In addition to installation of the gas line, other contractors and forces will locate and cap gas lines at locations shown in Plans (UT05, UT06 and UT07). The work is planned to occur prior to this project's Notice to Proceed date but work schedules may overlap.

Utility owners shall provide anticipated completion date per Section 1-07.17(2)

1-07.18 PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE

This is deleted in its entirety and replaced with the following:

Prior to the execution of the contract, the Contractor shall provide to the County Certificates of Insurance and Endorsements acceptable to the County meeting the requirements of the Contract (specific insurance coverage limits are set forth below). Coverage shall be maintained without interruption from the commencement of the Contractor's Work until Final Acceptance, or for such longer time as required by the Contract. Each policy obtained by Contractor shall be endorsed to provide County with 45 calendar day notice of material changes to or cancellation of such policy.

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If the scope of Work is significantly expanded, or if the aggregate limits on any of the Contractor's policies are eroded, the County may require Contractor to obtain additional coverage or reinstate eroded coverage. If the need for additional coverage is due to the fault of the Contractor or any of its Subcontractors, the Contractor shall be responsible for the cost of such additional coverage or any of its Subcontractors coverage. The Contractor shall provide proof of additional insurance required because of changed Work (Change Orders).

If the Contractor is required to correct damaged, defective or incomplete Work after Final Acceptance, it shall obtain at its own expense such insurance coverage as is required by the Contract, for the construction period. Such coverage shall be maintained throughout the period in which corrective work is performed.

Review of Contractor's insurance by County shall not relieve or decrease the duty of the Contractor to comply with the requirements of the Contract Documents.

Nothing contained within these provisions shall affect and/or alter the application of any other provision within this agreement.

Waiver of Subrogation

The Contractor waives all rights against the County, County's consultants, or any separate contractors, and their agents and employees, for damages caused by fire or other perils to the extent such damage cost is actually paid by property insurance applicable to the Work. The Contractor shall require similar waivers from all Subcontractors. This provision shall be valid and enforceable only to the extent permissible by the applicable property insurance policies.

Evidence of Insurance

The Contractor shall furnish the County with Certificates of Insurance and endorsements required by this Contract. All evidences of insurance must be certified by a properly authorized officer, agent, general agent or qualified representative of the insurer(s) and shall certify the name of the insured, the type and amount of insurance, the location and operations to which the insurance applies, the expiration date of the policy. The Contractor shall, upon demand of King County, make available to King County, in King County, certified copies of all such policies of insurance required in this Contract. Failure to provide such policies of insurance within a time acceptable to King County shall entitle King County to suspend or terminate the Contractor's work hereunder. Suspension or termination of this Contract shall not relieve the Contractor from its insurance obligation hereunder.

All subcontractors shall be required to include the County and Contractor as additional insureds on all Liability policies except Workers' Compensation and Professional Liability Errors and Omissions.

Minimum Scope and Limits of Insurance

The Contractor shall obtain and maintain the minimum insurance set forth below. By requiring such minimum insurance, King County shall not be deemed or construed to have assessed the

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risks that may be applicable to the Contractor under this Contract. The Contractor shall assess its own risks and if it deems appropriate and/or prudent, maintain greater limits and/or broader coverage. Each insurance policy shall be written on an "occurrence" form; excepting that insurance for professional liability, errors and omissions when required, may be acceptable on a "claims made" form. If coverage is approved and purchased on a "claims made" basis, the Contractor warrants continuation of coverage, either through policy renewals or the purchase of an extended discovery period, if such extended coverage is available, for not less than three years from the date of completion of the work which is the subject of this Contract Insurance coverage shall be at least as broad as stated below and with limits no less than:

General Liability. Coverage shall be at least as broad as Insurance Services Office form number CG 00 01 covering COMMERCIAL GENERAL LIABILITY. $1,000,000 combined single limit per occurrence and for those policies with aggregate limits, a $2,000,000 aggregate limit, including products and completed operations.

Explosion & Collapse, Underground Damage (XCU). Coverages shall apply for the same limits as the General Liability. Evidence of Insurance must specifically state coverage has not been excluded.

Automobile Liability. Coverage shall be at least as broad as Insurance Services Office form number CA 00 01 covering BUSINESS AUTO COVERAGE, symbol 1 "any auto"; or the combination of symbols 2, 8, and 9. $1,000,000 combined single limit per accident. If the work involves the transport of pollutants (as defined by the standard auto policy exclusion of pollution) the auto policy shall be endorsed to include endorsement CA 9948 (or its equivalent) and MCS 90.

Workers' Compensation. Statutory requirements of the State of residency. Coverage shall be at least as broad as Workers' Compensation coverage, as required by the Industrial Insurance Act of the State of Washington, as well as any similar coverage required for this work by applicable Federal or "other States" State Law.

Employer's Liability or "Stop Gap". Coverage shall be at least as broad as the protection provided by the Workers Compensation policy Part 2 (Employers Liability) or, in states with monopolistic state funds, the protection provided by the "Stop Gap" endorsement to the general liability policy.

Builder's Risk: The Contractor shall procure and maintain during the life of the Contract, or until acceptance of the project by King County, whichever is longer, "All Risk" Builders Risk Insurance at least as broad as ISO form number CP0020 (Builders Risk Coverage Form) with ISO form number CP0030 (Causes of Loss – Special Form) including coverage for earthquake, flood, collapse, theft, off-site storage and property in transit. The coverage shall insure for direct physical loss to property of the entire construction project, for 100% of the replacement value thereof. The policy shall be endorsed to cover the interests, as they may appear, of King County, Contractor and subcontractors of all tiers with King County and sub-contractors listed as a Named Insured. In the event of a loss to any or all of the work and/or materials therein and/or to be provided at any time prior to the final close-out of the Contract and acceptance of the project

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by King County, the Contractor shall promptly reconstruct, repair, replace, of restore all work and/or materials so destroyed. Nothing herein provided for shall in any way excuse the Contractor or its surety from the obligation of furnishing all the required materials and completing the work in full compliance with the terms of the Contract.

Contractor's Pollution Liability. Contractor's Pollution Liability coverage in the amount of $1,000,000 per occurrence and in the aggregate to cover sudden and non-sudden bodily and/or property damage to include the destruction of tangible property, loss of use, cleanup costs and the loss of use of tangible property that has not been physically injured or destroyed.. If Asbestos, Lead or PCB's are a potential exposure, such insurance shall not exclude pollution arising out of Asbestos, Lead and/or PCB operations. Evidence of Insurance must specifically state that coverage is included.

Professional Liability Errors and Omissions. $1,000,000 per claim/aggregate. The Contractor shall submit proof of insurance as part of the required submittals or provide evidence of compliance from its subcontractor that these insurance requirements have been met 30 calendar days prior to beginning of the work designated to be performed by a Professional.

U.S. Longshoreman and Harbor Worker's coverage. This Contract involves work on or adjacent to navigable water, as defined by the U.S. Department of Labor. This contract requires proof of insurance coverage in compliance with the statutory requirements of **Longshoreman and Harbor Worker's Compensation Act** (administered by the U.S. Department of Labor).

Protection & Indemnity (to include Jones Act). If this contract involves marine activities, or work from a boat, vessel, or floating platform, the Contractor shall provide Protection & Indemnity coverage including injury to crew (Jones Act) and passengers; Protection & Indemnity, SP 38 or SP 23 for $2,000,000 combined single limit per occurrence, and for those policies with aggregate limits, a $2,000,000 aggregate limit.

Pollution Liability (OPA, CERCLA). $1,000,000 and statutory limits of liability as applicable. Whenever performance of this contract involves marine activities or work from a boat, vessel, or floating platform, the Contractor shall provide Pollution insurance to satisfy U.S. Coast Guard requirements as respects the Federal Oil Pollution Act of 1990 and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended.

Hull and Machinery. Whenever performance of this contract involves marine activities or work from a boat, vessel, or floating platform, the Contractor shall provide coverage at Market Value of vessel on American Institute Hull Clauses, 6/2/77 form.

Deductibles/Self-Insured Retentions

Any deductibles or self-insured retention's must be declared to, and approved by, the County. The deductible and/or self-insured retention of the policies shall not limit or apply to the Contractor's liability to the County and shall be the sole responsibility of the Contractor.

Other Insurance Provisions

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The insurance policies required in this Contract are to contain and be endorsed to contain the following provisions:

With respect to all Liability Policies except Professional Liability and Workers Compensation:

The County, its officers, officials, employees, and agents are to be covered as additional insureds as respects liability arising out of activities performed by or on behalf of the Contractor in connection with this Contract. Additional Insured status shall include Products-Completed Operations.

The _____ also to be covered as an additional insured as respects liability arising out of activities performed by or on behalf of the Contractor in connection with this Contract.

The Contractor's insurance coverage shall be primary insurance as respects the County, its officers, officials, employees, and agents. Any insurance and/or self-insurance maintained by the County, its officers, officials, employees, agents and consultants shall not contribute with the Contractor's insurance or benefit the Contractor in any way.

The Contractor's insurance shall apply separately to each insured against whom a claim is made and/or lawsuit is brought, except with respect to the limits of the insurer's liability.

A Per Project Aggregate shall apply to the General Liability policy.

For Protection and Indemnity Insurance the Contractor shall waive all rights of subrogation against the County.

Acceptability of Insurers

Unless otherwise approved by the County:

Insurance is to be placed with insurers with a Best's rating of no less than A:VIII, or, if not rated with Best's, with minimum surpluses the equivalent of Best's surplus size VIII.

Professional Liability, Errors and Omissions insurance may be placed with insurers with a Best's rating of B+; VII.

If at any time the foregoing required policies shall fail to meet the above minimum requirements, the Contractor shall, upon notice to that effect from the County, promptly obtain a new policy, and shall submit the same to the County, with the appropriate certificates and endorsements, for approval.

Subcontractors

The Contractor shall include all subcontractors as insured under its policies, or shall furnish separate certificates of insurance and policy endorsements from each subcontractor. Insurance coverages provided by subcontractors, as evidence of compliance with the insurance requirements of this Contract shall be subject to all of the requirements stated herein

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1-07.23 PUBLIC CONVENIENCE AND SAFETY

The following is inserted at the end of this section:

The Contractor shall be responsible to notify, in writing, local fire, school, law enforcement authorities, Metro Transit or other affected persons as directed by the Engineer, not less than five (5) working days prior to construction operations that will deviate and/or delay traffic from the existing traffic pattern, so that these agencies may reroute emergency vehicles as necessary.

1-07.23(1) CONSTRUCTION UNDER TRAFFIC

The following is inserted at the beginning of this Section:

The Contractor shall keep all through traffic lanes open to travel without interference from work operations between the hours of 6:00 and 10:00 a.m. and 2:30 and 6:30 p.m. unless otherwise approved by the Engineer or as indicated in this special provision. The Contractor shall keep all turn movements, cross streets and approaches open to traffic:

- 16th Avenue South may be reduced to two lanes (one in each direction) between 16th Ave S Station 36+00 to Station 16th Ave S 61+00 for a period not to exceed 160 working days.
- 14th Avenue South may be reduced to two lanes (one in each direction) between 14th Ave South Station 23+00 to 14th Avenue South Station 47+00 for a period not to exceed 160 working days.

When approved by the Engineer, the Contractor may close one through-lane in each direction of travel on four-lane roadways. If the hours designated above do not conform to the actual peak traffic conditions, the Contractor shall curtail and adjust work operations according to the peak traffic hours as determined by experience and as approved by the Engineer.

No closures or detours to local access will be allowed under this Contract, including accesses located within the work zones defined in the contract plans. The Contractor shall maintain access to all business and residential properties. Business accesses shall accommodate customer access as well as delivery access. At all business accesses within the work areas the Contractor shall provide business access signing as follows:

- First line of text-"Business name"
- Second line of text-"OPEN"
- Third Line of Text- "ACCESS HERE"

The business access signs shall be black lettering on orange background and follow MUTCD recommendations for letter sizes and fonts.

Local street work on S. Sullivan Street and Dallas Avenue South shall be completed within 40 working days. No closures shall be implemented and no barriers shall be erected until beginning this work. Full access to these streets shall be re-established 40 working days after work on these streets has begun.

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South Orr Street may be closed only within the bridge construction work area until safe access is established under the new bridge. Construction of the hammerhead on South Orr Street shall be completed prior to any road restrictions are implemented.

The Contractor may propose Traffic Control Plans (TCP's) that comply with the MUTCD, ADA requirements, and these Specifications. Contractor proposed TCP's detailing the alternative accessible accesses shall be approved by the Engineer prior to implementation. The plans will either be returned for correction, approved as noted, or approved for use by the end of a 10 working day review period. Each time the plan is returned for correction, an additional 10 working day review period may be necessary.

1-07.23(2)A PEDESTRIAN CONTROL AND PROTECTION (NEW SECTION)

Except as provided for in the contract plans, all existing pedestrian routes and access points within the project limits, including sidewalks and crosswalks, shall remain open and clear at all times. The Contractor may propose Traffic Control Plans (TCP's) that comply with the MUTCD, ADA requirements, and these Specifications. Contractor proposed TCP's detailing the alternative accessible pedestrian route shall be approved by the Engineer prior to implementation. The plans will either be returned for correction, approved as noted, or approved for use by the end of a 10 working day review period. Each time the plan is returned for correction, an additional 10 working day review period may be necessary.

When the Engineer allows work areas to encroach upon a sidewalk or crosswalk area, and minimum clear width of 48-inches cannot be maintained for pedestrian use, an alternative accessible pedestrian route shall be provided. Separation of pedestrians from the work area and vehicular traffic is required.

Protective barricades, fencing, and bridges, together with warning and guidance devices and signs, shall be utilized so that the passageway for pedestrians is safe, well defined and accessible. Whenever pedestrian walkways are provided across excavations, they shall be provided with suitable handrails. Foot bridges shall be safe, strong, and free of bounce and sway, have a slip resistant coating, and be free of cracks, holes and irregularities that could cause tripping. Ramps, with a maximum slope of 8.3%, shall be provided at the entrance and exit of all raised footbridges. The maximum cross slope shall be 2.0%. When the existing facility is illuminated or TCP's requires illumination, illumination shall be provided during the hours of darkness. Retroreflective delineation shall be provided during hours of darkness.

Where accessible pedestrian routes are allowed to be closed by the Engineer during construction, an alternate accessible pedestrian route shall be provided that complies with the MUTCD, ADA requirements and these Specifications. The alternate accessible pedestrian route shall not have abrupt changes in grade or terrain. Barriers and channelizing devices shall be detectable to pedestrians who have visual disabilities. Where it is necessary to divert pedestrians into the roadway, barricading or channelizing devices shall be provided to separate the pedestrian route from the adjacent vehicular traffic lane. Barricading or channelizing devices used to separate

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pedestrian and vehicular traffic shall be crashworthy and, when struck by vehicles, present a minimum threat to pedestrians, workers, and occupants of impacting vehicles. At no time shall pedestrians be diverted into a portion of the street used concurrently by moving vehicular traffic.

In addition the Traffic Control Plan shall address the following:

All pedestrians, including persons with disabilities, shall be provided with a safe and accessible route.

The width of the existing pedestrian facility shall be maintained if possible. When it is not possible to maintain a minimum width of 60-inches throughout the entire length of the pedestrian route, a minimum width of 48-inches shall be provided with 60-inch x 60-inch passing zones spaced at maximum intervals of 200-feet to allow individuals in wheelchairs to pass.

Traffic control devices and other construction materials and features shall not intrude into the usable width of the sidewalk, alternate accessible pedestrian route, or other pedestrian facility.

Signs and other devices mounted lower than 84-inches above the temporary accessible pedestrian route shall not project more than 4-inches into the accessible pedestrian route.

A smooth, continuous hard surface shall be provided throughout the entire length and width of the pedestrian route throughout construction. There shall be no curbs or vertical elevation changes greater than ½-inch in grade or terrain that could cause tripping or be a barrier to wheelchair use. Vertical elevation differences between ¼-inch and ½-inch shall be beveled at a maximum 2:1 slope.

When channelization is used to delineate a pedestrian pathway, a continuous detectable edging shall be provided throughout the length of the facility such that pedestrians using a cane can follow it. Edging shall protrude at least 6-inches above the surface of the sidewalk or pathway with the bottom of the edging a maximum of 2-1/2 inches above the surface.

Temporary ramps shall be provided when an alternate accessible pedestrian route crosses a curb and no permanent curb ramps are in place. The width of the curb ramp shall be a minimum of 48-inches and the maximum slope of the ramp shall be 8.3%. The maximum cross slope shall be 2.0%. The bottom of the curb ramp shall be flush with the Roadway. Temporary detectable warning mats shall be installed at street crossings.

When possible, an alternate accessible pedestrian route shall be provided on the same side of the street as the disrupted route. When it is not possible, the alternate route shall be clearly identified at the nearest intersection crossing prior to the closure area.

Information regarding closed pedestrian routes, alternate crossings, and sign and signal information shall be communicated to pedestrians with visual disabilities by providing devices such as audible information devices, accessible pedestrian signals, or barriers and channelizing devices that are detectable to the pedestrians traveling with the aid of a cane or who have low vision.

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It is desirable that pedestrians cross to the opposite side of the roadway at intersections rather than mid-block. Appropriate signing shall be placed at the intersections prior to any pedestrian route closure.

If not otherwise stated in the contract provisions, access to transit stops shall be provided and maintained at all times. Transit stops may be temporarily relocated with approval of the transit agency and the Project Engineer.

At locations where adjacent alternate walkways cannot be provided, appropriate signs shall be posted at the limits of construction and in advance of the closure at the nearest crosswalk or intersection, to divert pedestrians across the street. Physical barricades shall be installed to prevent visually impaired people from inadvertently entering a closed area.

Measurement

No specific unit of measurement will apply to the lump sum item for pedestrian control and protection.

Payment

Payment will be made in accordance with Section 1-04.1 for the following Bid item included in the Proposal:

"Pedestrian Control and Protection", lump sum.

The lump sum contract payment shall be full compensation for all costs incurred by the Contractor for construction, maintenance, and removal of all protective barricades, fencing, and bridges, together with warning and guidance devices detailed in the Plans or any alternative accessible pedestrian routes proposed by the Contractor.

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1-08 PROSECUTION AND PROGRESS

1-08.1 SUBCONTRACTING

The following is inserted at the beginning of this section:

Prior to any subcontractor or lower tier subcontractor beginning work, the Contractor shall submit to the Engineer a certification (WSDOT Form 420-004) that a written agreement between the Contractor and the subcontractor or between the subcontractor and any lower tier subcontractor has been executed. This certification shall also guarantee that these subcontract agreements include all the documents required by the Special Provision titled "Federal Agency Inspection."

A subcontractor or lower tier subcontractor will not be permitted to perform any work under the contract until the following documents have been completed and submitted to the Engineer:

1. Request to Sublet Work (Form 421-012), and

2. Contractor and Subcontractor or Lower Tier Subcontractor Certification for Federal-aid Projects (Form 420-004).

The Contractor's records pertaining to the requirements of this Special Provision shall be open to inspection or audit by representatives of the Contracting Agency during the life of the contract and for a period of not less than three years after the date of Final Acceptance of the contract. The Contractor shall retain these records for that period. The Contractor shall also guarantee that these records of all subcontractors and lower tier subcontractors shall be available and open to similar inspection or audit for the same time period.

1-08.1(1) AFFIDAVITS OF AMOUNTS PAID (NEW SECTION

Upon Physical Completion of all work and as a condition precedent to final payment, the Contractor shall submit a final Affidavit of Amounts Paid, identifying amounts actually paid and amounts owed to each subcontracting firm for performance under the Contract. Failure to submit such affidavits may result in withholding of payments or the final payment. Affidavit forms will be provided by the County.

Site Visits: King County may at any time visit the site of the work and the Contractor's office to review records related to actual utilization of and payments to subcontracting firms. The Contractor shall maintain sufficient records necessary to enable King County to review utilization of subcontracting firms. The Contractor shall provide every assistance requested by King County during such visits.

1-08.3(1) GENERAL REQUIREMENTS

This section is deleted in its entirety and replaced with the following:

The Contractor shall submit Type B Progress Schedules and Schedule Updates to the Engineer for approval. Schedules shall show Work that complies with all time and order of Work requirements in the Contract. Scheduling terms and practices shall conform to the standards established in *Construction Planning and Scheduling, Second Editio*n, published by the Associated General Contractors of America. Except for Weekly Look-Ahead Schedules, all schedules shall meet these General Requirements, and provide the following information:

1. Include all activities necessary to complete the project including procurement of equipment and materials, submittals and submittal review times for materials and equipment, fabrication of materials and equipment, and installation of materials and equipment. The schedule should take into account resubmittal and reviews of those resubmittals by the Engineer.

2. Show the planned order of Work activities in a logical sequence.

3. Show durations of Work activities in working days as defined in Section 1-08.5. Activities shall have a maximum of 10 working days, except for procurement, submittals, and fabrication of materials and equipment.

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4. Show activities in durations that are reasonable for the intended Work.

5. Define activity durations in sufficient detail to evaluate the progress of individual activities on a daily basis.

6. Show the Substantial Completion of all Work associated with the construction of the new bridge within the authorized Contract Time.

7. Show the Physical Completion of all Work within the authorized Contract time.

The Contracting Agency allocates its resources to a Contract based on the total time allowed in the Contract. The Contracting Agency may accept a Progress Schedule indicating an early Substantial Completion Date or Physical Completion Date but cannot guarantee the Contracting Agency's resources will be available to meet an accelerated schedule. No additional compensation will be allowed if the Contractor is not able to meet their accelerated schedule due to the unavailability of Contracting Agency's resources or for other reasons beyond the Contracting Agency's control or by activities caused by the Contractor or its subcontractors.

The progress schedule is the Contractor's representation that it understands the Contract Documents and the requirements for constructing with Work in accordance with the Contract Documents. The Engineer's review of the schedule for conformance with the Contract Documents does not relieve the Contractor from constructing the project in accordance with the Contract Documents. If the Engineer determines that the Progress Schedule or any necessary Schedule Update does not provide the required information, then the schedule will be returned to the Contractor for correction and resubmittal.

The Engineer review of any schedule shall not transfer any of the Contractor's responsibilities to the Contracting Agency. The Contractor alone shall remain responsible for means and methods, adjusting forces, equipment, and Work schedules to ensure completion of the Work within the time(s) specified in the Contract Documents.

1-08.3(2)B TYPE B PROGRESS SCHEDULE

This section is deleted in its entirety and replaced with the following:

The Contractor shall submit a preliminary Type B Progress Schedule no later than ten (10) calendar days after the date the Contract is executed. The preliminary Type B Progress Schedule shall comply with all of these requirements and the requirements of Section 1-08.3(1).

The Contractor shall submit the executable P3 data files (not an un-executable PDF file) on CD and five printed copies of a Type B Progress Schedule depicting the entire project no later than 30-calendar days after the date the Contract is executed. The schedule shall be a critical path method (CPM) schedule developed by the Precedence Diagramming Method (PDM). Restraints may be utilized, but may not serve to change the logic of the network or the critical path. A resource driven schedule will not be accepted nor does it meet the requirements of this Contract.

The schedule shall include at least the following information:

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Contract Number and Title

Construction Start Date

Critical Path

Activity Description

Milestone Description

Activity Duration

Predecessor Activities

Successor Activities

Early Start (ES) and Early Finish (EF) for each activity

Late Start (LS) and Late Finish (LF) for each activity

Total Float (TF) and Free Float (FF) for each activity

Physical Completion Date

Data Date

Resources – number of craft per day (not crews per day) for each activity and construction equipment planned for each activity.

The Contractor shall provide a narrative report with the CPM schedule detailing its assumptions for constructing the Work. The assumptions with include constraints included in the schedule as defined by the Contract Documents, permits, or the Contractor. The narrative shall also identify the critical path activities and near critical path activities and why the Contractor selected those activities to be on the critical path.

The Engineer will evaluate the Type B Progress Schedule for conformance with the Contract Documents and/or return the schedule for corrections within 15-calendar days of receiving the submittal.

Preliminary, progress, and supplemental progress CPM schedules requested by the Engineer shall be submitted to the Engineer on compact discs (CDs) in Primavera P3 software format.

1-08.3(2)D WEEKLY LOOK-AHEAD SCHEDULE

This section is deleted in its entirety and replaced with the following:

Each week that Work will be performed, the Contractor shall submit a Weekly Look-Ahead Schedule showing the Contractor's and all Subcontractors' proposed Work activities for the next three weeks. The Weekly Look-Ahead Schedule shall include the description, duration and sequence of Work, along with the planned hours of Work. This schedule shall be prepared using

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Excel or other spreadsheet program unless approved by the Engineer. The activities on the Weekly Look-Ahead Schedule shall identify the activities related to the CPM schedule. The Weekly Look-Ahead Schedule shall be submitted to the Engineer at the weekly construction coordination meeting.

1-08.3(3) SCHEDULE UPDATES

The first paragraph of this section is deleted and replaced with the following:

The Contractor shall provide the Engineer with a Schedule Update by the 5th of each month until Physical Completion of the project.

The following paragraph is inserted after the second paragraph:

The Contractor shall provide a narrative report with each schedule update detailing the work completed during the month, any changes to the schedule logic, any changes to activity durations, any changes to the critical path, and any changes to its assumptions for constructing the Work, including assumed constraints included in the schedule as defined by the Contract Documents, permits, or the Contractor.

1-08.3(5) PAYMENT

This section is deleted in its entirety and replaced with the following:

Payment will be made in accordance with Section 1-04.1, for the following Bid item when it is included in the Proposal:

> "Type B Progress Schedule", lump sum.
>
> The lump sum price shall be full pay for all costs for furnishing the Type B Progress Schedule and preliminary Type B Progress Schedule.
>
> Payment of 15% of the lump sum price will be made upon agreement by the Engineer that the schedule complies with the Contract Documents.
>
> Payments of 3% of the lump sum will be made to the Contractor each month thereafter until the project is Physically Complete, provided the Contractor complies with the requirements of Section 1-08.3(3).

All costs for providing Weekly Look-Ahead Schedules are considered incidental to other items of Work in the Contract.

1-08.4 PROSECUTION OF WORK

This section is deleted in its entirety and replaced with the following:

<u>First Notice to Proceed – Preparation Phase</u>: The First Notice to Proceed will be given after the Contract has been executed by the Contracting Agency. The First Notice to Proceed authorizes the Contractor to perform activities including work planning, scheduling, submittals, design for Contractor-designated design responsibility items, processing of submittals for procurement of materials, products, and equipment, procurement of materials, products and equipment for which

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submittals have been satisfactorily completed, and similar preparatory and administrative activities.

The following items shall be submitted within 10 calendar days to the County for review and approval during this Preparation Phase. This time will not be considered part of the Contract Time:

A. Spill Prevention, Control and Countermeasures (SPCC) Plan;

B. Building Condition Survey;

C. Caisson Plans, including design of cutting shoe, design of cofferdam and caisson scheduled activities, identifying individual caisson segment activities;

D. Traffic Control Plan(s).

Submittals A – D must be completed and approved by the County prior to issuance of the Second Notice to Proceed.

Second Notice to Proceed – Construction Phase: The Contractor shall not commence with the site construction work until the Second Notice to Proceed has been given by the Engineer. The Contractor shall commence construction activities on the project site within 14 calendar days of the Second Notice to Proceed Date, unless otherwise approved in writing. The Contractor shall diligently pursue the work to the Physical Completion date within the time specified in the Contract. Voluntary shutdown or slowing of operations caused by the Contractor shall not relieve the Contractor of the responsibility to complete the work within the time(s) specified in the Contract.

1-08.4(1) ORDER OF WORK (NEW SECTION)

All work below the Mean Higher High Water (MHHW), as shown in the Plans, that is not isolated from standing or flowing waters by a cofferdam or other means approved by the Engineer will be considered "in-water work" unless noted otherwise. In-water work includes, but is not limited to, pile (sheet, pipe and timber) installation or removal, excavation, backfilling, concrete placement and demolition activities. Work performed from within the confines of an enclosed cofferdam will not be considered in-water work. Excavation from within the confines of the caisson dredge wells will not be considered in-water work. Sinking of the caissons themselves without enclosure by cofferdams will not be considered in-water work once the cutting shoe has been sunk 40 feet or more below the floor of the Duwamish Waterway.

All pile driving that exceeds an accumulation of 45 minutes per hour will be considered "extended duration ".

The Contractor shall complete specific work elements within the allowable work period as follows:

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Description of Work Element	Allowable Work Period
All in-water work except "extended duration" pile driving within MHHW (see below).	August 1 to February 15
All in-water "extended duration" pile driving by means of impact hammer.	August 15 to November 30

1-08.5 TIME FOR COMPLETION

The third paragraph of this section is deleted and replaced with the following:

Upon the issuance of the Second Notice to Proceed the Contractor shall have 14 calendar days to mobilize its materials, equipment and labor forces to commence construction activities at the Project Site.

Contract Time in working days shall begin after the Contractor has mobilized and no later than 14 calendar days after the issuance of the Second Notice to Proceed.

The following is inserted at the end of this section:

This project shall be complete in 662 working days.

The new bridge shall be substantially complete and opened to traffic on or before February 17, 2012.

The Engineer will give the Contractor written notice of the Physical Completion date for all work the Contract requires. That date shall constitute the Physical Completion date of the Contract, but shall not imply the County's acceptance of the work or the Contract.

The Engineer will give the Contractor written notice of the Completion Date of the Contract after all the Contractor's obligations under the Contract have been performed by the Contractor. The following events must occur before the Completion Date can be established:

1. The physical work on the project must be complete; and
2. The required manufacturer's warranties have been provided; and
3. All spare parts and training of County personnel have been provided; and
4. The Contractor must furnish all documentation required by the contract and required by law, to allow the Contracting Agency to process final acceptance of the contract. The following documents must be received by the Project Engineer prior to establishing a completion date:

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a. Certified Payrolls (Federal-aid Projects)

b. Material Acceptance Certification Documents

c. Annual Report of Amounts Paid as MBE/WBE Participants or Quarterly Report of Amounts Credited as DBE Participation, as required by the Contract Provisions.

d. FHWA 47 (Federal-aid Projects)

e. Final Contract Voucher Certification

1-08.9 LIQUIDATED DAMAGES

This section is deleted in its entirety and replaced with the following:

Time is of the essence in this Contract. Delays inconvenience the traveling public, obstruct traffic, interfere with and delay commerce, and increase risk to roadway users. Delays also cost taxpayers undue sums of money, adding time needed for administration, engineering, inspection, and supervision.

Accordingly, the Contractor agrees:

1. To pay $28,000 in liquidated damages for each working day beyond February 17, 2012 that the proposed South Park Bridge is not Substantially Complete and operable and fully open to vehicular traffic, pedestrian traffic and marine traffic.

2. To pay (according to the following formula) liquidated damages for each working day beyond the number of working days established for Physical Completion.

   LIQUIDATED DAMAGES FORMULA

   LD=0.15C/T

   where:

   LD = Liquidated damages per working day (rounded to the nearest dollar).

   C = Original Contract amount.

   T = original time for Physical Completion.

3. To authorize the Engineer to deduct these liquidated damages from any money due or coming due to the Contractor.

When the Contract work has progressed to the extent that the County has full benefit of the facilities, both from the operational and safety standpoint, and only minor incidental work, replacement of temporary substitute facilities, or correction or repair remains to physically complete the total Contract, the Engineer may determine the Contract work is substantially complete. The Engineer will notify the Contractor in writing of the project Substantial

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Completion Date. For overruns in Contract time occurring after the Engineer determined substantial completion date, the formula for liquidated damages shown above will not apply.

For overruns in Contract time occurring after the project Substantial Completion Date, liquidated damages shall be assessed at $2,500 per day for direct engineering and related costs assignable to the project until the actual Physical Completion Date of all the Contract work.

The Contractor shall complete the remaining work as promptly as possible. Upon request by the Engineer, the Contractor shall furnish a written schedule for completing the physical work on the Contract.

Liquidated damages will not be assessed for any days for which an extension of time is granted. No deduction or payment of liquidated damages will, in any degree, release the Contractor from further obligations and liabilities to complete the entire Contract.

1-09 MEASUREMENT AND PAYMENT

1-09.3(1) STEEL COST ADJUSTMENT (NEW SECTION)

General: The Contracting Agency will make a steel cost adjustment, either a credit or a payment, for qualifying changes in the index price of raw steel used in the production of specified materials that are incorporated into the permanent Work. The adjustment will be applied to partial payments made according to Section 1- 09.9. The adjustment will be applied to the following materials:

- Reinforcing steel conforming to Section 9-07 used in non-proprietary walls, and pedestrian and vehicular bridge Substructure and Superstructure.
- Structural steel conforming to Section 6-03.2 used in pedestrian and vehicular bridge Substructure and Superstructure.

The adjustment is not a guarantee of full compensation for steel price changes. Any adjustment provided by this provision shall not obligate the Contracting Agency for any costs due solely to changes in steel costs beyond the amount adjusted by this provision. The Contracting Agency does not guarantee that steel will be available at the base steel cost or monthly steel cost. No additional adjustment will be made for changes in the cost of manufacturing, fabrication, shipping, or storage.

For the purpose of determining the adjustment, the Base Steel Cost shall be the *Engineering News-Record* ***Materials Cost Index for Steel $/CWT*** index value for the month prior to the month that Bids are opened. The Base Steel Cost is fixed for the duration of the Contract and will be used for determining all adjustments.

The Monthly Steel Cost shall be the *Engineering News-Record* ***Materials Cost Index for Steel $/CWT*** index value for the month that the steel is actually shipped from the producing mill. If the specified index ceases to be available for any reason, the Contracting Agency at its discretion will select and begin using a substitute price source or index to establish the Monthly Steel Cost.

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For each month that steel material that is specified in this Section is incorporated into the permanent Work or paid for as Materials on Hand, the Contractor shall provide the Engineer with written documentation (such as bills of lading, invoices, or purchase orders) of the actual date and quantity of steel in pounds shipped from the producing mill to the manufacturer and the Contracting Agency contract number that the steel is used in.

Measurement: No adjustment will be made if the Monthly Steel Cost is within 10 percent of the Base Steel Cost. No adjustment will be made for Work performed after the authorized time for completion. No adjustment will be made for any products manufactured from steel having a mill shipping date prior to the date the contract is executed.

If the Monthly Steel Cost is greater than or 1 equal to 110% of the Base Steel Cost, then:

$$\text{Adjustment} = (\text{Monthly Steel Cost} - (1.1 \times \text{Base Steel Cost})) \times \frac{Q}{100}$$

If the Monthly Steel Cost is less than or equal to 90% of the Base Steel Cost, then:

$$\text{Adjustment} = (\text{Monthly Steel Cost} - (0.90 \times \text{Base Steel Cost})) \times \frac{Q}{100}$$

Where Q = total pounds of reinforcing steel and structural steel paid in the current month's progress payment. No adjustment will be provided for quantities of steel exceeding the estimated quantity shown in the Contract, even though the actual quantities required may deviate from those listed. If the Contract provides no estimated quantities, then the maximum quantity of reinforcing steel or structural steel shall be the quantity determined by the Engineer using Contracting Agency approved shop drawings and a unit weight of 490-pounds per cubic foot of steel.

Payment: Payment will be made in accordance with Section 1-04.1 for the following bid item included in the bid proposal:

"Steel Cost Adjustment", by calculation.

To provide a common proposal for all bidders, the Contracting Agency has entered an amount in the proposal to become a part of the Contractor's total bid.

No adjustment payment will be provided until the Contractor provides written documentation of the actual date and quantity of steel in pounds shipped from the producing mill to the manufacturer. If the Contractor fails to provide the required documentation, then adjustment credits will be calculated using a shipment date determined by the Engineer in accordance with Section 1-05.1.

1-09.9 PAYMENTS

The fifth paragraph is deleted and replaced with the following:

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Upon completion of all work and after final inspection (Section 1-05.11), the amount due the Contractor under the contract will be paid based upon the final estimate made by the Engineer and presentation of a Comparison of Quantities signed by Contractor. Such voucher shall be deemed a release of all claims of the Contractor unless a claim is filed in accordance with the requirements of Section 1-09.11 and is expressly excepted from the Contractor's certification on the Comparison of Quantities.

1-09.11(1)A DISPUTES REVIEW BOARD MEMBERSHIP

The second paragraph of this section is deleted and replaced with the following:

The Contracting Agency and Contractor shall each select their member and negotiate an agreement, separate and apart from this Contract, with their respective Board member within 30-calendar days of execution of the Contract.

The following is added at the end of this section:

In the event of an impasse in selection of the third member, either the Contracting Agency or the Contractor or both may appeal to the King County Superior Court for selection of a third member by the court from a list or lists submitted to the court by the Contracting Agency and/or the Contractor. An impasse shall be considered to have been reached if the two members appointed by the Contracting Agency and the Contractor to the Board have been unable to appoint the third member in a period of 30- calendar days after the approval of the last of such two members.

1-09.11(1)B DISPUTES REVIEW BOARD PROCEDURES

The following is added at the end of the second paragraph of this section:

The Agreement shall include the frequency of the Board's visits to the Project and its interactions with the Contracting Agency and the Contractor to keep abreast of the construction development and potential disputes.

1-09.11(3) TIME LIMITATION AND JURISDICTION

This section is deleted in its entirety and replaced with the following:

For the convenience of the parties of the contract it is mutually agreed by the parties that any claims or causes of action which the Contractor has against King County arising from the contract shall be brought within 180 calendar days from the date of Final Acceptance (Section 1-05.12) of the contract by King County; and it is further agreed that any claims or causes of action shall be brought only in the Superior Court of King County. The parties understand and agree that the Contractor's failure to bring suit within the time period provided shall be a complete bar to any such claims or causes of action. It is further mutually agreed by the parties that when any claims or causes of action which the Contractor asserts against King County arising from the Contract are filed with the County or initiated in court, the Contractor shall permit the County to have timely access to any records deemed necessary by the County to assist in evaluating the claims or action.

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1-10 TEMPORARY TRAFFIC CONTROL

1-10.1(2) DESCRIPTION

The third paragraph of this section is deleted and replaced with the following:

The Contractor shall provide signs and other traffic control devices not otherwise specified as being furnished by the Contracting Agency. The Contractor shall erect and maintain all construction signs, warning signs, detour signs, and other traffic control devices necessary to warn and protect the public at all times from injury or damage as a result of the Contractor's operations which may occur on or adjacent to highways, roads, streets, sidewalks, or paths. No work shall be done on or adjacent to any traveled way until all necessary signs and traffic control devices are in place.

1-10.2(1) GENERAL

In reference to this Section, the TCM and TCS shall be certified as worksite traffic control supervisors by one of the following organizations:

The Northwest Laborers-Employers
Training Trust
27055 Ohio Ave.
Kingston, WA 98346
(360) 297-3035

Evergreen Safety Council
401 Pontius Ave. N.
Seattle, WA 98109
1-800-521-0778 or
(206) 382-4090

The American Traffic Safety Services Association
15 Riverside Parkway, Suite 100
Fredericksburg, Virginia 22406-1022
Training Dept. Toll Free (877) 642-4637
Phone: (540) 368-1701

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1-10.2(2) TRAFFIC CONTROL PLANS

The second paragraph of this section is deleted and replaced with the following:

When the Contractor's chosen method of performing the work in the contract requires some form of temporary traffic control, the Contractor shall either: (1) designate and adopt, in writing, the traffic control plan or plans from the contract documents that support that method; (2) submit a Contractor's plan that modifies, supplements or replaces a plan from the contract documents; or (3) where no traffic control plan appears in the contract documents, submit a Contractor-proposed traffic control plan. Any Contractor-proposed plan, modification, supplement or replacement shall show the necessary construction signs, flaggers, spotters and other traffic control devices required to support the work. Any Contractor-proposed traffic control plan shall conform to the established standards for plan development as shown in the MUTCD, Part VI. The Contractor's submittal, either designating and adopting a traffic control plan from the contract documents or proposing a Contractor-developed plan, shall be provided to the Engineer for approval at least ten working days in advance of the time the signs and other traffic control devices are scheduled to be installed and utilized. The Contractor shall be solely responsible for

submitting any proposed traffic control plan or modification, obtaining the Engineer's approval and providing copies of the approved Traffic Control Plans to the Traffic Control Supervisor.

1-10.3(3)A CONSTRUCTION SIGNS

The fourth paragraph of this section is deleted in its entirety.

1-10.3(3)L EXISTING SIGNING (NEW SECTION)

During the life of the contract, the Contractor shall be responsible for all existing signing damaged or removed by construction operations. Any signs damaged or removed shall be replaced by the Contractor, to the satisfaction of the Engineer, at Contractor expense.

Warning and regulatory signs may be temporarily relocated to portable sign stands for convenience of construction, subject to the approval of the Engineer. When temporarily installed on posts, the signs shall be located at or as near as practical to their original locations and shall have a minimum vertical clearance above the pavement in accordance with the Manual on Uniform Traffic Control Devices. Upon completion of construction in the area immediately surrounding the permanent sign location, the Contractor shall reinstall the sign and support in its permanent location. All costs for the work shall be included in the unit contract bid prices for the various other items of work in the bid proposal.

1-10.3(4) PAINT LINES AND LEGENDS (NEW SECTION)

When paint lines are obliterated due to construction activities or pavement restoration, temporary pressure-sensitive pavement marking tape, traffic buttons, temporary lane markers, or delineators shall be installed where designated by the Engineer. These temporary features shall be removed only upon installation of permanent traffic channelization.

Temporary centerline striping shall consist of placing strips of pressure sensitive pavement marking tape at 10 to 15 foot intervals along the centerline. Temporary marking tape shall be placed in sets of two 12-inch strips of yellow 4-inch wide marking tape set 4 inches apart and parallel to the center line with each set of 1-foot double line spaced 10 to 15 feet along the center line of the roadway, or the equivalent surface area in temporary lane markers (TLMs).

Temporary stop bars shall consist of a 12-inch wide stop bar made up of three parallel 4-inch strips of temporary pavement marking tape placed at locations designated by the Engineer. All other temporary pavement markings utilizing pavement-marking tape shall be designated by the Engineer.

Pressure-sensitive pavement marking tape used on the wearing course prior to installation of permanent lane markers, traffic buttons, or permanent paint striping shall be removed from the pavement current with, or immediately subsequent to, the installation of permanent pavement markings.

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Temporary pavement markings shall be maintained in serviceable condition by the Contractor for the duration of time it is in use. Layout and marking in preparation for application and the application and removal of the temporary striping shall be the Contractor's responsibility.

Temporary pavement marking tape shall meet the requirements of Section 9-34.5.

Damage to the pavement resulting from removal of temporary pavement marking, including the use of high heat sources, shall be repaired by the Contractor at no expense to the Owner.

1-10.4(2) ITEM BIDS WITH LUMP SUM FOR INCIDENTALS

The following is added at the end of this section:

The bid proposal does not contain the item “Project Temporary Traffic Control,” lump sum. The provisions of Section 1-10.4(2) shall apply.

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EARTHWORK

2-01 CLEARING, GRUBBING, AND ROADSIDE CLEANUP

2-01.1 DESCRIPTION

The following is added at the end of this section:

The Contractor shall not disturb or damage existing plant material designated for preservation and shall contact the Project Engineer if there is any conflict between the Plans and field conditions. All costs of protecting from damage those plants designated to be saved shall be incidental to the bid item "Clearing and Grubbing."

The Contractor shall remove all plants within the area to be cleared that are not designated for preservation. Prior to clearing operations, the Contractor shall flag all trees over 15 feet high or six-inch caliper or greater (measured six inches above ground line) that are to be removed. The Contractor shall notify the Project Engineer after flagging is completed and arrange a meeting prior to the removal of any existing trees on the project. At this meeting the Contractor and Project Engineer shall inspect those trees designated for removal and make any necessary changes.

If the Contractor removes or damages any existing plant or plants not designated for removal because of any act, omission, neglect, or misconduct in the execution of the Work, such plant(s) shall be restored or replaced by the Contractor to a condition similar or equal to that existing before such damage or removal.

All replacements shall be inspected and approved prior to planting. Planting procedures will be subject to approval. All replacements shall be guaranteed to survive in a healthy condition.

The Contractor shall be responsible for the protection of tops, trunks, and roots of existing trees that are to remain on the project site. Existing trees subject to construction damage shall be boxed, fenced, or otherwise protected before any work is started. Heavy equipment or stockpiles shall not be allowed within the branch canopy. The Contractor shall remove interfering branches without injury to the tree trunks and cover cuts with tree paint.

<u>Grading Around Trees</u>: Where excavating, or filling within the branch spread of trees that are to remain, the work shall be performed as follows:

1. **Trenching**: When trenching occurs around trees to remain, the tree roots shall not be cut, but the trench shall be tunneled under or around the roots by careful hand-digging and without injury to the roots.

2. **Raising Grades**: When the existing grade at tree is below the new finished grade, and fill not exceeding 16 inches is required, clean washed gravel graded from one- to two-inch size shall be placed directly around the tree trunk. The gravel shall extend out from trunk on all sides a minimum of 18 inches and finish approximately two inches above the finished grade at tree. Install gravel and cover with filter fabric before any earth fill is placed. New earth fill shall not be

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left in contact with the trunks of any trees requiring fill. Trees marked for preservation that are buried in fills over 16 inches deep shall have an open dry well of durable masonry (without mortar) situated at least 12 inches from the tree trunk. All wells are to be properly drained. Before fills of over 16 inches are made upon the tree root areas, it is advisable to spread at least a six-inch minimum layer of broken stone or coarse gravel covered by inverted sod shall be spread to facilitate proper drainage and aeration.

3. **Lowered Grades**: Existing trees in areas where the new finished grade is to be lowered, shall have regrading work done by hand to elevation as indicated. Roots as required shall be cut cleanly three inches below finished grade and cuts covered with tree paint. Trees marked for preservation that are located more than six inches above proposed grades shall stand on broad rounded mounds and be graded smoothly into the lower level. Exposed or broken roots shall be cut clean and covered with topsoil.

2-02 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

2-02.1 DESCRIPTION

The following is added at the end of this section:

The following items shall be removed:

Building Demolition – Parcel #2185001045

Building Demolition – Parcel #2185600080

Building Demolition – Parcel #2185000860

Building Demolition – Parcel #2185000895

Building Demolition – Parcel #7883607340

Monitoring Pedestals

Street and Traffic Signs

Overhead Advertising Sign

Creosote Logs

Telephone Booth

Clothes Receiving Bin

Chain Link Fence

Guardrail

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Overhead Business Sign

Removals under this section also include, but are not limited to, pipes, catch basins, inlets, and manholes, asphalt pavement, approach walls, wharfs, concrete and/or asphalt sidewalks, buildings, curbs, traffic islands and traffic curbs, beam guardrail, street and traffic signs, overhead advertising signs, underground storage tanks, mailboxes, luminaries (pedestal/pole/head/foundation), guard rails, bus stops, creosote logs, raised pavement markers, and buttons.

This Work shall include of removing, handling, and disposing of asbestos in the areas described in the 'PHASE II ENVIRONMENTAL SITE ASSESSMENT REPORT, South Park Bridge Replacement Project Seattle, Washington - September 2009". The Phase II Environmental Assessment Report will be made available to the Contractor as described in the Special Provisions to Section 1-02.4. In accordance with WISHA, OSHA and PSCA, the Contractor shall keep at least one copy of the Phase I and II Environmental Assessment Report on-site and available for review during the project duration.

2-02.3 CONSTRUCTION REQUIREMENTS

The following is added at the end of this section:

Building Demolition

The Contractor shall demolish and remove the structure and foundation as shown in Plans. All demolition waste shall be removed from the site and properly disposed of at a licensed facility.

Written documentation shall be provided to the owner certifying the proper disposal of all waste materials. Adjacent properties shall be protected from project debris.

The Contractor shall properly retire any existing gas, water, septic systems, and sewer service laterals to the property, including any other utility connections.

The Contractor shall properly remove any dispose of any asbestos, oil tanks or any other hazardous material that may be encountered on the property. Phase II Report, as described in Section 1-02.4, summarizes parcels with hazardous materials and asbestos materials. Excavated areas shall be graded to match existing contours.

Monitoring Pedestals

Where shown in the Plans or specified by the Project Engineer, the Contractor shall remove monitoring pedestals. Pedestals are reinforced concrete pile approximately 12 inches in diameter, extend approximately 5 feet above existing ground and have a depth of approximately 10 feet. The Contractor shall notify the Project Engineer 5 working days in advance of removal. The Contractor shall backfill any voids created by pedestal removal with the same type of material surrounding the void.

Street and Traffic Signs

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Where shown in the Plans or specified by the Project Engineer, the Contractor shall remove existing street and traffic signs. The Contractor shall notify the Project Engineer 5 working days in advance of removal. The Contractor shall deliver signs to the Project Engineer. The Contractor shall backfill any voids created by post removal with the same type of material surrounding the void.

Overhead Advertising Sign

Where shown in the Plans or specified by the Project Engineer, the Contractor shall remove existing overhead advertising sign. The Contractor shall notify the Project Engineer 3 working days in advance of removal and provide traffic control plan if deemed necessary for public safety. The Contractor shall deliver sign to the Project Engineer. The Contractor shall backfill any voids created by post removal with the same type of material surrounding the void.

Creosote Logs

Where shown in the Plans or specified by the Project Engineer, the Contractor shall remove creosote logs. The Contractor shall notify the Project Engineer 2 working days in advance of removal. The Contractor shall dispose of creosote logs in accordance with Federal and State Laws and Regulations.

Telephone Booth

Where shown in the Plans or specified by the Project Engineer, the Contractor shall remove existing telephone booth. The Contractor shall notify the Project Engineer 5 working days in advance of removal. The Contractor shall deliver telephone booth to the Project Engineer. The Contractor shall backfill any voids created by telephone booth removal with the same type of material surrounding the void.

Clothes Receiving Bin

Where shown in the Plans or specified by the Project Engineer, the Contractor shall remove existing Clothes Receiving Bin. The Contractor shall notify the Project Engineer 5 working days in advance of removal. The Contractor shall deliver Clothes Receiving Bin to the Project Engineer. The Contractor shall backfill any voids created by post removal with the same type of material surrounding the void.

Chain Link Fence

Chain link fence fabric, braces, rails, barbed wire, rods, gates, posts anchors and posts shall be completely removed. No breaking or cutting of the posts at the ground surface will be permitted. This item shall include chain link fences of various types, including security fencing on Boeing property within the project limits.

Backfill the voids created by post removal with the same type of material surrounding the void. Backfilling and compaction shall be in accordance with Section 2-09.3(1)E.

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Guardrail

Guardrail shall be removed in accordance to Section 8-11.3(4).

Overhead Business Sign

Where shown in the Plans or specified by the Project Engineer, the Contractor shall remove existing overhead advertising sign. The Contractor shall notify the Project Engineer 5 working days in advance of removal. The Contractor shall deliver sign to the Project Engineer. The Contractor shall backfill any voids created by post removal with the same type of material surrounding the void.

Delivery of Contracting Agency Salvaged Materials

Chain link fence elements to be salvaged shall be as identified by the Project Engineer. The Contractor shall deliver the chain link fence elements determined to be salvageable to the Project Engineer

The Contractor shall give three working days advance notice of delivery to the Project Engineer.

The Contractor shall unload and stockpile the chain link fence elements in the maintenance yard at the locations indicated by the Maintenance Supervisor. The Contractor shall stack the elements in neat and secure piles.

2-02.3(2) REMOVAL OF BRIDGES, BOX CULVERTS AND OTHER DRAINAGE STRUCTURES

The following is added at the end of this section:

The Contractor may remove existing South Park Bridge in stages conceptually shown in the Plans and described in Section 2-02.3(2)A; or stages as developed by the Contractor and approved by the Project Engineer.

Bridge Demolition Plan

The Contractor shall submit a bridge demolition plan with working drawings and calculations to the Project Engineer for approval in accordance with Section 6-01.9, showing the method of removing the existing bridge(s), or portions of bridges, as specified.

The bridge demolition plan shall show support bents, bracing, guys, lifting devices, lifting attachments, the sequence of demolition and removal, the type of equipment to be used in all demolition and removal operations, the location of cranes and barges, the location of support or lifting points, and the weights of structure parts being removed. The plan shall include a crane stability analysis and crane load calculations based on the controlling crane picks of the Contractor's plan. The plan shall detail the containment, collection, and disposal of all debris. The plan shall show all stages of demolition.

The Contractor shall not begin removal operations until receiving the Project Engineer's approval of the bridge demolition plan.

Removal Limits in Water

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The existing piers of South Park Bridge within the wetted perimeter of the Duwamish Waterway which do not conflict with new construction shall be removed to elevations as shown in the Contract Plans or described elsewhere the Contract. All broken concrete, and other bridge removal debris shall be removed from within the confines of the demolition cofferdams with Duwamish Waterway.

Removing Portions of Existing Concrete

The Contractor shall protect traffic from falling concrete and debris, in accordance with the debris collection and containment provisions of the bridge demolition plan as approved by the Project Engineer.

Use of Explosives

Explosives shall not be used in the demolition.

Requirements for Closing Bridge to Traffic Prior to Beginning Removal

The Contractor shall not close the existing bridge to traffic, and shall not begin bridge removal operations, until the following conditions are met:

1. The Contractor has received the Project Engineer's approval of the bridge demolition plan.
2. The Contractor has received the Project Engineer's approval of all shop drawings and materials submittals for materials required for the Work to be executed during the closure.
3. The Contractor has submitted a report on the status of material delivery to the Project Engineer. The report shall specify the materials already available at the site, the materials yet to arrive at the site, and the scheduled delivery dates of the materials yet to arrive at the site, with written verification from the supplier or copies of confirmed purchase orders indicating the delivery dates of the materials yet to arrive at the site.
4. The Contractor shall provide an updated progress schedule in accordance with Section 1-08.3 confirming that the scheduled delivery of materials will meet the schedule to complete the Work within the allowed time. The Contractor shall supplement the progress schedule with a written narrative describing the assumed production rates and planned resource allocations that support the bridge construction activity durations provided in the progress schedule.
5. The Contractor has received the Project Engineer's approval to proceed.

The Contractor shall remove and/or abandon catch basins where shown in the Plans or where designated by the Project Engineer. The Contractor shall excavate and completely remove the structure including casting and outlet trap, concrete encasement, and bricks, as applicable to each Bid item. Connecting pipes shall be removed or plugged with a pumpable, flowable cement

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slurry and completely filling the pipe (see Section 7-08.3(4). The resultant void shall be backfilled with material approved by the Project Engineer and the material compacted to the satisfaction of the Project Engineer.

All grates, frames and covers shall remain the property of King County and will be hauled from the project by County forces. The Contractor shall exercise reasonable care in the removal and salvaging of existing grates, frames and covers and shall stockpile the salvaged grates, frames and covers in locations designated by the Project Engineer.

2-02.3(2)A REMOVING EXISTING BRIDGE (NEW SECTION)

Description

After the existing bridge is closed to traffic the Contractor shall remove the existing bridge as shown in the Plans. Lead paint shall be assumed to be present on the steel bridge rails, steel members, machinery and all steel bridge materials. All timber shall be assumed to be creosote treated. Disposal of the creosote treated timbers, steel, lead contaminant, and all debris generated by the demolition operations shall be in a Contractor provided waste site. The Contractor provided waste site shall meet the requirements set forth in the Special Provisions for the materials to be disposed.

Removal of existing drainage and manhole structures on the existing bridge and approach fills shall be considered included in the unit bid item "Removing Existing Bridge," Lump Sum.

Construction Requirements

The Contractor shall submit a bridge demolition plan, lead health protection plan, and debris containment system plan along with working drawings and calculations, in accordance with Section 6-01.9, to the Project Engineer for approval, which show the method of removing the existing bridge, approach structures, portions of the existing concrete piers as specified, approach embankments, and provide the details for the debris containment system.

The bridge demolition plan shall show support bents, bracing, guys, lifting devices, lifting attachments, the sequence of demolition and removal, the type of equipment to be used in all demolition and removal operations, the location of cranes, the location of support or lifting points, and the weights of structure parts being removed. The plan shall include a crane stability analysis and crane load calculations based on the controlling crane picks of the Contractor's plan. The plan shall include any temporary shoring of the approaches that will be needed to support construction equipment. The bridge demolition plan shall be prepared and sealed by a licensed Structural Engineer in the State of Washington. The plan shall detail the containment, collection, and salvage or disposal of all debris. The plan shall show all stages of demolition.

Approval of the demolition Plans shall indicate conformance only with scheduling and operational characteristics of the demolition plan. The Contractor shall remain solely responsible for all aspects of safety, structural capacity, and structural stability, applicable regulations and permits associated with the demolition work.

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When the bridge removal work includes removal of a truss, and when the Contractor's removal method involves use of a crane or cranes to pick, lift, and remove the truss, the Contractor shall confirm the truss dead load weight prior to beginning the truss removal operation. The operation of confirming the truss dead load shall be performed at both ends of the truss, and shall ensure that the truss is broken free of its support bearings. The Contractor's method of confirming the truss dead load, whether by hydraulic jacks or other means, shall be included in the Contractor's bridge demolition plan submittal.

Prior to any demolition work on the bridge, the approved containment system to capture and collect all debris shall be in place, and traffic shall be transferred onto the new bridge. The existing bridge shall be completely removed, except for the partial removal of the existing concrete piers, as shown in the Plans. Piles shall be removed as shown in the Plans and the resultant voids shall be backfilled with material approved by the Project Engineer and the material compacted to the satisfaction of the Project Engineer.

The existing concrete piers and any associated formwork shall be removed below the existing ground line as required and shown in the Plans. All broken concrete, and other bridge removal debris shall be collected and removed for reuse, recycling, or disposal at a Contractor provided waste site meeting the requirements set forth in the Special Provisions for the materials to be disposed.

The Contractor shall protect the Duwamish Waterway from all falling concrete and debris, and shall collect by vacuum the materials generated as the activity is taking place. The methods of collection and containment shall be in accordance with the debris collection and containment provisions of the bridge demolition plan as approved by the Project Engineer.

2-02.3(3) REMOVAL OF PAVEMENT, SIDEWALKS, AND CURBS

The following is added at the end of this section:

Removal shall be accomplished by making a neat longitudinal vertical cut along the boundaries of the area to be removed. Cutting shall be accomplished with a self-propelled saw capable of cutting to a 12-inch depth. The use of pneumatic hammers or punches will not be permitted.

Removing Cement Concrete Sidewalk

During sawcutting and removal of sidewalk care shall be taken to prevent damage to underground utilities, meters and adjacent pavements.

Removal of a bus shelter requires the notification specified in Section 1-07.28.

Removing Cement Concrete Curb

During sawcutting and removal of curb care shall be taken to prevent damage to underground utilities, meters and adjacent pavements.

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2-02.3(4) REMOVAL AND DISPOSAL OF HAZARDOUS MATERIALS (NEW SECTION)

Hazardous materials exist on this project. Approximate limits of contamination and hazardous materials are identified in the Plans based on limited testing performed. The area history, prior studies and/or test results indicate encountering soil and sediment containing metals, volatile organic chemical, semi-volatile organic chemicals, PCB, and petroleum contamination in the project limits.

Contaminated soil as defined for this project is a solid waste which requires classification and disposal at municipal/commercial facilities, use as landfill cover material, or regulatory approval for disposal to private property. For the purposes of this project dangerous or hazardous waste is soil that meets or exceeds the Federal hazardous waste criteria 40 CFR and Washington Dangerous Waste Criteria WAC 173-303..

The section incorporates by reference the latest revisions of the following documents.

1. The National Institute for Occupational Safety and Health (NIOSH)
    a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities
2. Code of Federal Regulations (CFR)
    a. 29 CFR 1910 Occupational Safety and Health Standards (OSHA)
    b. 29 CFR 1926 OSHA Construction Standards
    c. 40 CFR 261
3. Environmental Protection Agency (EPA)
    a. SW-846, Test Methods for Evaluating Solid Waste Physical/Chemical Methods
4. Washington Administrative Code (WAC)
    a. WAC 173-303 Dangerous Waste Regulations
    b. WAC 173-340 Model Toxics Control Act - Cleanup
    c. WAC 296-62 General Occupational Health Standards
    d. WAC 173-204 Sediment Management Standards
5. Washington State Department of Ecology
    a. Publication 94-49 Guidance on Sampling and Data Analyses Methods
    b. Publication 97-602 Analytical Methods for Petroleum Hydrocarbons

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Definitions

Site-Specific Health and Safety Plan (HASP): A supplemental plan to the Construction Safety and Security Manual which establishes in detail the protocols necessary for protecting workers, on-site personnel, visitors, potential off-site personnel, and the public from potential hazards that may be encountered during removal, excavation, stockpiling, handling, sampling, transportation, and disposal of contaminated soils, water, and other material.

Certified Industrial Hygienist (CIH): A trained specialist with at least five years experience in contaminated material processing and working knowledge of selection and use of PPE, air monitoring, regulation, and other health and safety issues.

Site Safety and Health Officer (SSHO): A trained specialist in health and safety with a minimum of three years' experience and working knowledge of use of (Personal Protective Equipment) PPE, regulations and hazard identification.

Contaminated Groundwater: Groundwater containing levels hazardous or natural materials in excess of water quality discharge criteria.

Contaminated Material: General term for soil, groundwater, or other debris below the ground surface that contains contaminants including petroleum hydrocarbons, polyaromatic hydrocarbons (PAHs), low lead levels, chlorinated volatile organic compounds (cVOCs), and arsenic, below hazardous waster levels.

Dangerous/Hazardous Waste: Construction debris, soil, sediment or groundwater containing hazardous material in excess of Washington Dangerous Waste criteria or Federal Hazardous Waste criteria as defined in WAC 173-303 and 40 CFR 261

Permissible Exposure Levels (PEL): Maximum amount or concentration for each contaminant that a worker may be exposed to under OSHA regulations.

Suspected Contaminated Material: Soil, groundwater, or other debris in contact or close proximity to known Contaminated Material, and that has not been tested yet for verification of contamination levels; or material that has visual or odor evidence of contamination.

The Contractor shall perform all testing of suspected hazardous or contaminated material at the direction of the Project Engineer. Qualifications of the personnel responsible for the testing will be approved by the Project Engineer and identified below:

Qualifications:

CIH:

1. Minimum of five years experience in contaminated material processing.
2. Demonstrable experience in Personal Protective Equipment (PPE) selection and use, contaminated material identification and disposal procedures, air monitoring techniques, and site control measures.

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3. Working knowledge of federal and state OSHA regulations.

4. Completion of required OSHA Training in accordance with 29 CFR 1910.120, including completion of 40-hour supervisory training and eight hour annual update and completion of three days on-site training by a fully qualified instructor.

SSHO:

1. Minimum of three years experience in contaminated material and waste site remediation or related work, including air monitoring techniques and the development of health and safety programs for personnel working in potentially toxic environments.

2. Current certification in first aid and cardiopulmonary resuscitation (CPR).

3. Working knowledge of federal and state OSHA regulations.

4. Completion of required OSHA Training in accordance with 29 CFR 1910.120, including completion of 40-hour supervisory training and eight hour annual update and completion of three days on-site training by a fully qualified instructor.

Responsibilities

CIH:

1. Responsible for certifying the HASP, any task specific HASPs, and all additions and/or modifications thereto.

2. Required to be accessible to the SSHO as necessary, to assist in the identification and evaluation of potential hazards and the development of appropriate procedures for addressing known or suspected conditions or activities that may pose routine occupational hazards or immediate danger to life or health of work site personnel, Sound Transit personnel, utility crews working in the project construction area, personnel related to third party stakeholders or the public.

SSHO:

1. Required to be on Site and present during contaminated material work to be completed as part of the Contract. Such work includes, but is not limited to: air monitoring, removal of contaminated soil and groundwater, removal of Underground Storage Tanks (UST), and work related to the presence or potential for unknown contaminated materials.

2. Responsible for the development, implementation, enforcement, and monitoring of the HASP for the project.

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3. Responsible for conducting the pre-construction indoctrination, Pre-Entry Briefings, and other periodic training of on-site personnel with regard to contents of the HASP and other safety requirements to be observed during construction.

4. Responsible for performing air monitoring as required by the HASP.

Authority

1. The CIH and the SSHO shall have the authority to:

   a. Suspend field activities if health and safety of work site personnel, Sound Transit personnel, other crews working in the Project Site, or the public is endangered.

   b. Suspend individuals from field activities due to infractions of the HASP.

Certifications

1. CIH and SSHO current certifications:

   a. OSHA 29 CFR 1910.120 Training.

   b. CPR Training.

Training:

The Contractor shall be responsible for the health and safety conditions related to contaminated substances within the project limits, including the health and safety of workers and public during working and non-working hours. The Contractor shall provide a HASP to the Project Engineer two weeks prior to starting any excavation in areas identified as contaminated/hazardous. The Contractor shall meet the training requirements of WAC 296-843-200. The Contractor shall provide 24 hours of health and safety training to all workers involved in the excavation and removal actions on the areas known to have contamination. The Contractor shall also provide 24 hour training for up to eight (8) Contracting Agency employees prior to demolition and excavation and subsequent refresher each year for duration of the project.

Laboratories:

Use laboratories for analytical analyses which follow procedures that are consistent with the Model Toxics Control Act (MTCA) guidelines for selection of appropriate analytical procedures (WAC 173-340-830), The Washington State Department of Ecology's Guidance on Sampling and Data Analyses Methods (Ecology Publication number 94-49) and Analytical Methods for Petroleum Hydrocarbons ((Ecology Publication number 97-602), and USEPA's "Test Methods for Evaluating Solid Waste Physical/Chemical Methods", SW-846.

Copies of the environmental reports are available for review at the Builders Exchange of Washington website http://www.kingcounty.gov/procurement.aspx. Necessary permits for this work will be furnished by the Contracting Agency as noted in Section 1-07. The Contractor shall

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be and remain solely responsible for all work, records, and reports required to perform the Work described in this section. The Contractor shall submit a HASP and debris containment system plan to the Project Engineer for approval, which shows excavation means and methods, stockpile locations and containment, transportation methods, treatment design, best management technologies, and disposal locations.

The Contractor shall notify the Project Engineer two weeks prior to beginning work in the approximate area identified in the Plans and reference documents as contaminated or hazardous. The Contractor shall notify the Project Engineer immediately if contamination is discovered in areas other than those identified in the Plans and reference documents, or is suspected through observations such as an oily sheen or discolored soils that may or may not emit strong chemical odors.

Contaminated Soil and Hazardous Material

The Project Engineer will determine the limits of excavation required. All material that is designated by the Project Engineer to be removed shall be handled and stored in a manner that prevents the spread of contamination to adjacent soil or water. Separate stockpiles shall be maintained for known hazardous or contaminated material and for suspected hazardous or contaminated material. An off-site stockpile location has been secured by the Contracting Agency located within 5 miles of the project. A stockpile of contaminated soil cannot remain on-site longer than 90 calendar days, without a permit. If the Contractor elects to stockpile longer than calendar 90 days, Contractor shall obtain Project Engineer's approval and obtain permit at no additional cost to the Contracting Agency. The Contractor shall place contaminated soil on a 6 mil polyethylene liner, within a bermed area and covered with plastic sheeting in accordance with WSDOT Standard Specification 8-01.3(5) to prevent infiltration of rain water. The Contractor shall inspect the stockpiles daily and maintain the sheeting, replacing any worn or ripped sections.

Contaminated soil and water encountered during construction must be handled and disposed of in accordance with Federal and State Laws and Regulations. The Contractor shall furnish all materials, equipment, labor and facilities for handling and disposal of any contaminated soil and/or water discovered during the project.

The Contractor shall divert surface water to prevent entry into the excavation to avoid and/or limit the need for dewatering. No dewatering from the excavation shall be performed without prior approval of the Project Engineer.

Stockpiles shall be sampled based on volume; three samples for 100 cubic yards, five samples for 500 cubic yards, seven samples for 1,000 cubic yards and ten samples for 2,000 cubic yards. Samples shall be tested for metals, volatile organics, semi-volatile organics and PCBs. Thirty samples are estimated. All samples shall be tested as directed by the Project Engineer. Each sample shall be tested by an accredited and licensed analytical laboratory. As approved by the Project Engineer, the Contractor shall transport and dispose of the contaminated soil and/or water at a legally permitted facility. If analytical results indicate soils are below the clean-up levels specified in the Model Toxics Control Act (MTCA) Method A, the material may be used in

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embankment or fill construction as directed by the Project Engineer. Alternative disposal sites for non-hazardous waste will be allowed if approved or directed by the Project Engineer.

The Contractor shall transport hazardous or contaminated material and dispose of it at a permitted facility or approved location. The Contractor shall provide the Project Engineer with a copy of the shipping manifest or bill of lading indicating the amount of material hauled to disposal, and bearing the disposal site operator's confirmation for receipt of the material.

Duwamish Waterway

Approximate limits of contamination within the caisson cofferdams are shown in the Plans. Excavated material that is deemed non-contaminated and verified by the Project Engineer, can qualify for open water disposal at Elliott Bay. Contaminated materials not suitable for open water disposal shall be excavated, contain, dewatered or solidified, transported, and disposed of at a RCRA Class D facility or alternative as approved by the Engineer. Hazardous materials not suitable for open water disposal shall be excavated, contained, dewatered or solidified, transported, and disposed of at a RCRA Class C facility as approved by the Engineer. Management of this material shall be in accordance with local, state, and federal rules. A plan for managing this material shall be included in the dredging quality control plan.

A permit for disposal of dredged material has been acquired by the Contracting Agency. All excavation and open water disposal shall be in accordance with the Corps of Engineers Dredge Material Management Permit (DMMP). Open water disposal sites within Elliott Bay are located at the following coordinates:

Latitude 47 35.92' Longitude 122 21.38' NAD27

Latitude 47 35.91' Longitude 122 21.45' NAD83

Sediments Best management practices for preventing discharge of turbid water and sediments to the waterway shall be implemented in accordance with the BMPs outlined in the TESC Plan.

The Contractor shall notify the Project Engineer four (4) weeks prior to performing any dredging Contract Work. The Project Engineer will schedule a pre-dredge conference to include the Contractor with the Dredged Material Management Office (DMMO). The Contractor shall submit a dredging quality control plan to the Project Engineer ten (10) working days prior to the pre-dredge conference. The Project Engineer will submit the plan to the Seattle District Regulatory Office seven (7) working days in advance of the pre-dredge conference with DMMO. The dredging quality control plan shall include at a minimum the following:

1. Project Schedule
2. Dredging and disposal procedures
3. Water quality monitoring plan
4. Coordination procedures.

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5. Management of contaminated and hazardous material.

Contaminated Water

All water that is removed from upland areas of contamination, including free water that leeches from contaminated soil stockpiles or water that is suspected of being contaminated, shall be collected, handled and stored in a manner that prevents the spread of contamination to adjacent soil or water. The Contractor shall transport contaminated water and dispose of it at a permitted facility. The Contractor shall provide the Project Engineer with a copy of the shipping manifest or bill of lading indicating the amount of material hauled to disposal, and bearing the disposal site operator's confirmation for receipt of the material. The Contractor shall meet the TESC requirements specified in Section 8-01

Asbestos Handling and Disposal

Prior to performance of any Contract work, the Contractor shall obtain all permits from, and provide notification to, the Washington State Department of Labor and Industries, the U.S. EPA, the local air pollution control agency, and other permitting and regulatory agencies with jurisdiction over the work involving asbestos as the law requires.

Prior to commencing asbestos related work, the Contractor shall provide the Project Engineer with written verification of approvals and notifications that have been given and/or obtained from the required jurisdictional agencies, and the Contractor's schedule for all work involving asbestos removal. The schedule shall include the sequencing and scheduling of asbestos related work, and coordination with subcontractors. The Contractor shall notify the Project Engineer when all approvals have been received and notifications have been made, as required by the agencies involved.

The Contractor shall ensure the safety of all workers, visitors to the site, and the general public in accordance with all applicable laws, rules, and regulations.

The Contractor shall designate a Washington State Certified Asbestos Supervisor (CAS) to personally supervise the asbestos removal and to ensure that the handling and removal of asbestos is accomplished by certified asbestos workers, pursuant to Washington State Department of Labor and Industries standards. The Contractor shall ensure that the removal and disposal of asbestos meets the requirements of EPA regulation 40 CFR Part 61, local health department regulations, and all other applicable regulations.

The Asbestos Containing Materials (ACM) identified in the Phase II Report, as described in Section 1-02.4, shall be removed in their entirety. Materials containing less than one percent asbestos content shall be handled in accordance with WAC 296-62-077 and WISHA Regional Directive 23.30.

In accordance with WISHA and OSHA, Contractor shall remove ACM using trained and licensed contractors and certified asbestos abatement workers and supervisors (except for deregulated roofing sealants, mastics, and coatings). Contractor shall provide a 10 working day

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notification before abatement begins. Contractor shall notify the Puget Sound Clean Air Agency, and pay required notification fee prior to beginning removal.

All maintenance and housekeeping personnel working in the building shall require annual two-hour asbestos awareness training in accordance with WAC 296-62-077 until all ACM has been removed. This training shall include a complete listing of known asbestos materials and their locations.

2-02.3(5) REMOVAL OF APPROACH WALLS (NEW SECTION)

The Contractor shall remove existing approach walls and retained fill to a point 4 feet below the finished ground elevation or as shown in the Contract Plans, whichever is lower.

2-02.3(6) REMOVING PORTION OF EXISTING STRUCTURE – WHARF (NEW SECTION)

The Contractor shall remove a portion of Boeing wharf structure in accordance with the limits specified on the site preparation Contract Plans. Removal of wharf structure shall include saw cutting concrete slab, removal of concrete, creosote piles and boards, pavement, portions of abandoned utilities, chain link fence and miscellaneous debris.

Existing sheet pile walls at the perimeter of the wharf shall not be removed nor disturbed as part of removal of wharf. Concrete rubble and slabs on riverbank shall not be removed as part of REMOVING PORTION OF EXISTING STRUCTURE - WHARF. All demolition waste shall be removed from the site and properly disposed of at a licensed facility.

Creosote Pile Removal and Disposal

All existing piling and associated timber materials shall be considered to be creosote treated and shall be considered contaminated material.

Remove existing pile by means of a vibratory hammer. The piling shall not be broken off intentionally by twisting, bending or other deformations.

The extracted piling shall be temporarily stored within a lined containment basin to prevent materials and sediments from spilling onto the ground. Upon removal the extracted piling shall be moved expeditiously into the containment basin. The pilings shall not be shaken, hosed-off, left hanging to drip or other actions which would result in removal of adhering material from the piling.

Cut extracted piling to size as required by the Contractor selected disposal organization for transport and disposal. Collect all saw dust and cutting within the containment basin.

Cut up piling, wood debris, absorbent pads, sediments, piling demolition residue and the containment basin liner shall be packed into a container. The contents of the container shall be considered creosoted timber, creosoted piling and associated debris and dispose in accordance with Section 1-07.5.

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Holes remaining after extraction of the pilings shall not be filled.

Utilities at Boeing Wharf

The Contractor shall cut and plug utilities connected to or under wharf in accordance to Special Provision 7-08.3(4), and remove utilities from under the portion of wharf to be removed. The Contractor shall immediately notify the Project Engineer if he discovers unidentified utilities on, under, attached or adjacent to the wharf.

Prior to cutting any utilities the Contractor shall install a hanger of sufficient strength to support the cut and plugged end of the utility to remain in place. All utilities to remain shall be inspected by Boeing representative for approval after Contractor has installed hangers, cut, plugged and removed utilities.

The Boeing Company has identified an abandoned utility as "6 In. Diam. Chemical Drain Line" and line is shown in Plans. Contractor shall treat this utility line as containing unknown hazardous materials and shall perform all work associated with utility in accordance with state and federal regulations. Contact Boeing representative prior to performing removal for additional information, coordination and arrangements for delivery of removed utility pipe to Boeing for disposal.

2-02.3(7) REMOVING PORTION OF EXISTING STRUCTURE – FENDER (NEW SECTION)

Remove fender in two phases to accommodate construction of the proposed bridge and demolition of the existing bridge.

Phase One

Phase one of the fender removal shall include removal of that portion of the existing fender system as necessary to construct the proposed bridge as depicted in the Contract Plans and/or that portion of the existing fender system which cannot be removed once the proposed bridge is commissioned and operational. The precise limits of the Phase One removal shall be identified by the Contractor and submitted to the Project Engineer for approval.

Phase Two

Phase two of the fender removal shall include removal of the remaining elements of the existing fender systems once the proposed bridge is commissioned and operational.

Fender System Removal and Disposal

All existing piling and associated timber fender system materials shall be considered to be creosote treated and shall be considered contaminated material.

Remove existing pile by means of a vibratory hammer. Remove piling slowly to minimize turbidity in the water column as well as sediment disturbance. The piling shall not be broken off intentionally by twisting, bending or other deformations. If the piling has broken off at or near the mud line such that removal by a vibratory hammer is not practical the pile shall be cut off at

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the mud line by use of a pneumatic underwater chainsaw or other approved means. If a pile is broken off below the mud line it shall remain in place.

Remove piling during low current and low water to the extent possible.

Prior to commencement of pile removal the Contractor shall assess the condition of the existing piling. The Contractor shall create a log outlining the locations and number of pilings that are deemed to be deteriorated or damage to point that extraction by vibratory means are anticipated to be unsuccessful. Provide the Project Engineer with a copy of the log.

The Contractor shall locate the positions of all piling by means of Global Positioning System (GPS) to provide baseline information for debris characterization if any piling is broken off or cut off. The locations of the piling may be used should future dredging or construction in the vicinity be required. Locate the existing piling in the Project coordinate system.

The extracted piling shall be temporarily stored within a lined containment basin to prevent materials and sediments from re-entering the water column. Runoff water will be allowed to return directly to the waterway. Upon removal the extracted piling shall moved expeditiously from the water into the containment basin. The pilings shall not be shaken, hosed-off, left hanging to drip or other actions which would result in removal of adhering material from the piling.

Cut extracted piling to size as required by the Contractor selected disposal organization for transport and disposal. Collect all saw dust and cutting within the containment basin.

The Contractor shall use a floating boom to capture floating surface debris. The floating boom shall be equipped with absorbent pads to contain any oil sheens.

Cut up piling, floating debris, absorbent pads, sediments, construction/demolition residue and the containment basin liner shall be packed into a container. The contents of the container shall be considered creosoted timber, creosoted piling and associated debris and dispose in accordance with Section 1-07.5.

Holes remaining after extraction of the pilings shall not be filled.

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2-02.4 MEASUREMENT

The following is added at the end of this section:

The lump sum Contract price for "Removal of Structure and Obstruction" contains the following approximate quantities of materials and completed Work:

Item	Approx. Quant.	Unit
Building Demolition – Parcel #2185001045	1	Each
Building Demolition – Parcel #2185600080	2	Each

Building Demolition – Parcel #2185000860	1	Each
Building Demolition – Parcel #2185000895	1	Each
Building Demolition – Parcel #7883607340	1	Each
Monitoring Pedestals	2	Each
Street and Traffic Signs	20	Each
Overhead Advertising Sign	1	Each
Creosote Logs	5	Each
Telephone Booth	1	Each
Receiving Clothes Booth	1	Each
Chain Link Fence	2210	L.F.
Guard Rail	30	L.F.
Underground Storage Tanks	5	Each
Overhead Business Sign	1	Each

The quantities listed are 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 "Removal of Structure and Obstruction" for the above items even though the actual quantities required may deviate from those listed.

Remove Cement Concrete Sidewalk will be measured per square yard of sidewalk removed.

Remove Cement Concrete Curb will be measured per linear foot of curb removed along the face of curb.

No specific unit of measurement shall apply to the lump sum item of Removing Portion of Existing Structure – Wharf.

No specific unit of measurement shall apply to the lump sum item of Removing Portion of Existing Structure – Fender.

Removal of existing manhole or drainage structure when shown on the Plans and identified as a separate bid item shall be measured as Removing Manhole and/or Removing Drainage Structure per each.

2-02.5 PAYMENT

The following is added at the end of this section:

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"Hazardous Material Handling and Disposal", by force account as provided in Section 1-09.6.

All costs associated with storing stockpiled hazardous waste soils, collecting, testing, handling and storing contaminated water, loading the stockpiled material into the hauling conveyance for transport to the disposal site, testing of excavated material, and transporting and disposing of hazardous materials at an approved facility will be paid by force account under the item "Hazardous Material Handling and Disposal".

"Contaminated Material Handling and Disposal – Upland", by force account as provided in Section 1-09.6.

All costs associated with storing stockpiled contaminated soils from the upland areas, collecting, testing, handling and storing contaminated water, loading the stockpiled material into the hauling conveyance for transport to the disposal site, testing of excavated material, and transporting and disposing of contaminated materials at an approved facility will be paid by force account under the item "Contaminated Material Handling and Disposal - Upland".

Contaminated Material Handling and Disposal – Waterway", by force account as provided in Section 1-09.6.

All costs associated with storing stockpiled contaminated soils as a result of special excavation from the Duwamish Waterway, collecting, testing, handling and storing contaminated water, loading the stockpiled material into the hauling conveyance for transport to the disposal site, testing of excavated material, and transporting and disposing of contaminated materials at an approved facility will be paid by force account under the item "Contaminated Material Handling and Disposal - Waterway".

To provide a common basis for all bidders, the Contracting Agency has entered an amount in the proposal to become a part of the Contractor's total bid.

Payment for preparing the dredging quality control plan and attending the pre-dredge conference is not part of this item, but is paid for under "Excavation for Caisson" under Section 6-22.5

Payment for training personnel is not part of this item, but is paid for under "Training".

"Removing Existing Bridge", lump sum.

"Removal and Disposal of Asbestos Material", lump sum.

"Removing Portion of Existing Structure - Wharf", lump sum.

The lump sum Contract price for "Removing Portion of Existing Structure – Wharf" shall be full payment for all costs associated with removing all materials of the existing wharf structure including removal, pile removal, containment of materials, hauling, stockpiling and disposing of material.

"Removing Portion of Existing Structure - Fender", lump sum.

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The lump sum Contract price for "Removing Portion of Existing Structure – Fender" shall be full payment for all costs associated with removing all materials of the existing fender system including removal, pile cutting, development of pile location log, locating piling, containment of materials, disposal of materials, hauling, stockpiling and disposing of material.

"Remove Cement Conc. Sidewalk", per square yard.

"Remove Cement Conc. Curb", per linear foot.

Removal of existing manhole or drainage structure when shown on the Plans and identified as a separate bid item shall be paid as Remove Manhole and/or Removing Drainage Structure per each.

2-03 ROADWAY EXCAVATION AND EMBANKMENT

2-03.3(5) SLOPE TREATMENT

The following is added at the end of this section:

Roadway excavation and embankments shall be constructed as shown on the typical roadway sections and details in the Plans.

On hillside construction, the existing ground shall be benched as the layers of embankment material are being placed. Each bench shall penetrate the slope at least four feet and shall not be more than four feet high. The horizontal face of the bench shall slope inward at approximately 0.1 foot per foot. The Project Engineer may order the Contractor to place gravel backfill for drains, drain pipe or both to control any seepage.

Benching construction shall be included in the other roadway excavation and embankment items in the project. No further compensation will be made.

2-03.3(7)C CONTRACTOR-PROVIDED DISPOSAL SITE

The first paragraph is deleted and replaced with the following:

No waste site has been provided by the County for the disposal of material and debris. The Contractor shall make all arrangements, at Contractor expense, for the disposal of waste materials and shall protect the County from any and all damages arising there from.

2-03.3(19) POND EXCAVATION INCL. HAUL (NEW SECTION)

This bid item shall include all work, labor, and equipment to excavate, haul, compact, construct necessary embankments, and embankment compaction for rain gardens and earth berms as shown on the Plans.

2-03.3(19)A GRADING FOR RAIN GARDEN (NEW SECTION)

Rain garden survey staking shall be performed by the Contractor. The Owner will set control hubs on the street centerline with elevations (see Section 1-05.8). The Project Engineer will

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provide the Contractor with a stake-out sheet prior to construction. Each stake-out sheet will include horizontal and vertical control for rain garden construction.

The Contractor shall establish the number of survey points to clearly identify rain garden bottom and top, shape and elevations. After staking, the Contractor shall delineate rain garden shape with marking paint. The Project Engineer will approve survey information and rain garden shape before excavation begins. Upon approval of paint markings, the Contractor shall set stakes to maintain limits of excavation.

All rain gardens shown on the stake-out sheets shall be constructed to an accuracy of 0.25 feet in location and 0.02 feet in elevation unless otherwise noted. "Critical grading points" as shown on the stake out sheets shall require an elevation accuracy of 0.08 feet. All other remaining drainage features shall be constructed to an accuracy of 0.50 feet for location and 0.17 feet for elevation.

Finish grades at all the critical grading points shall be reported to the Project Engineer for approval prior to the placement of special soil mix (bioretention soil.) The Contractor shall provide 5 check elevation points within the bottom of each rain garden prior to placement of special soil mix.

Grading within root zones of existing trees to be protected shall be under the direction of the Project Engineer. Trees shall be protected per COS Sections 1-07.16(2) and 8-02.3(7). Should grading conflict with existing Project Site conditions, the Contractor shall consult with the Project Engineer prior to proceeding with the Work.

No heavy equipment shall operate within the rain garden or earth berm perimeter subsurface pipe placement, backfilling, tree pit preparation, or mulching.

Excavation within 6-inches of final native soil grade shall not be permitted if Project Site soil is saturated (3% above optimum moisture content).

No materials or substances shall be mixed or dumped within the rain garden or earth berm area that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations.

Relocation and/or adjustments of water meters shall be coordinated per Section 7-15 Water Service Connection Transfers.

Rain gardens with a utility crossing through the rain garden soil or a side sewer within 18-inches from the bottom of the rain garden soil shall require a clay trench dam to be constructed within the existing utility trench to prevent migration of water along the utility service. A clay trench dam shall be placed and constructed at locations directed by the Project Engineer. All work, materials, and equipment to construct Clay Trench Dam shall be considered included in the unit bid price for the utility and no separate payment will be made.

Prior to finishing rain water excavation, the Project Engineer will inspect native soil to establish if there are any soil lenses that might direct significant volumes of water to a private property or

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other area of concern. If such a soil lens is identified the Project Engineer shall determine if a rain garden liner is necessary.

Prior to placement of special soil mix (bioretention soil) in each rain garden, the Contractor shall notify the Project Engineer to inspect and take a photograph of the rain garden. If any sediment laden runoff has entered the rain garden, the sediment deposition shall be removed by overexcavating the rain garden by a 3-inch minimum. An additional 3-inches of special soil mix (bioretention soil) shall be imported at the Contractor's expense.

The finished elevation shall be flush with walks, curbs, pavements and driveways, unless adjacent to a bermed area, as verified by the Project Engineer. Upon completion of finish grading work, all excess material shall be removed from the Project Site and disposed of accordingly.

2-03.3(19)B GRADING FOR EARTH BERM (EMBANKMENT COMPACTION) (NEW SECTION)

Finish grades at all the Critical Grading Points shall be reported to the Project Engineer prior to the placement of mulch. Earth berm elevations shall meet the accuracy as described in Section 2-03.3(19)A. If design elevations are not met, the Project Engineer will require the Contractor to rework the soil to meet the design requirements, solely at the Contractor's expense. Following placement of mulch, the Project Engineer shall verify a consistent uniform mulch depth of 3-inches or as indicated on the Plans.

All fill material import, placing, compacting, and work associated with berming, raising elevation, building slopes, embankments , and fills shall be considered included in the Work and Bid item for Pond Excavation Incl. Haul.

2-03.3(19)C MINERAL AGGREGATE TYPE 26 (FOR RAIN GARDEN (NEW SECTION)

This bid item shall include all Work to haul, furnish labor, materials, and equipment to place mineral aggregate type 26 to grade shown in the Plans. This Work includes backfilling around the drain and underdrain pipes and structures within the rain garden. Backfill shall be placed in layers no more than 3 inches thick and loosely compacted and graded so that final settling leaves the backfill flat and at the elevations specified in the Plans. For material gradation see Section 9-03.12(3)A.

2-03.3(20) SAND/GRAVEL BLANKET (NEW SECTION)

This bid item shall include all Work to furnish and install sand drainage blanket material on the river bottom according to the depth for coverage indicated in the Plans. The material shall not be pushed off a barge into the river channel. The material shall be placed on the river bottom in a careful manner to minimize sediment suspension. The Contractor shall be responsible for maintaining, monitoring, and adding new material should river scour erode any part of the sand/gravel blanket area. See Section 9-03.13(1) "Sand Drainage Blanket" for material gradation. Sand Drainage Blanket should be interpreted to mean Sand/Gravel Blanket.

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2-03.3(21) SHORELINE EXCAVATION INCL. HAUL (NEW SECTION)

This bid item shall include all Work associated with the excavation and hauling of materials designated in the boundaries set by the Project Engineer as shoreline excavation in the Plans. This Work should be performed in accordance with Section 8-01. Prior to excavation, the Contractor shall clear and grub the area as shown in Plans in accordance with Section 2-01.

The Work shall include the removal and hauling of soil, riprap, and any unsuitable foundation material as defined in Section 2-03.3(14)E. Excavated material considered for stockpiling should be handled and used in accordance with 2-02.3.

The Contractor shall excavate and grade the area to the elevation designated in the Plans. Additional excavation per South Shoreline Restoration/Mitigation Planting Plan and Details shall be considered included in this item and not included in the volume reported in the Summary of Quantities.

2-03.4 MEASUREMENT

The following is inserted after the first paragraph:

Only one determination of the original ground elevation will be made on this project. Measurement for roadway excavation and embankment will be based on the original ground elevations recorded previous to the award of this Contract, and the alignment, profile, grade and roadway section as shown in the Plans and as staked by the Project Engineer. Control stakes will be set during construction to provide the Contractor with all essential information for the construction of excavation and embankments.

Earthwork quantities will be computed, either manually or by means of electronic data processing equipment, by use of the average end area method.

Copies of the preliminary ground cross section notes will be available for the Bidder's inspection before the opening of bids at the Office of the Manager, Engineering Services Section, Road Services Division, Department of Transportation, 2nd Floor, 201 South Jackson Street, Seattle, Washington. At the time the bid is submitted, it shall be understood that the Bidder has inspected the cross sections.

Upon award of the Contract, copies of the original ground cross sections will be furnished to the successful bidder on request of the Project Engineer.

Mitigation area excavation will be measured by the cubic yard in its original site and the quantities calculated by the neat lines of the staked cross-sections. Only one determination of the original ground elevation will be made on this project. Measurement for wetland mitigation excavation and/or embankment will be based on the original ground elevations recorded previous to the award of this Contract, minus the structure excavation removal quantities and the alignment, grade, and details shown in the Plans, and as staked by the Project Engineer. Control stakes will be set during construction to provide the Contractor with all essential information for the construction of excavation or embankment.

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Pond Excavation Incl. Haul will be measured per cubic yard.

Mineral Aggregate Type 26 shall be measured per cubic yard.

The fourth paragraph is deleted and replaced with the following:

Sand Drainage Blanket shall be interpreted to mean Sand/Gravel Blanket and will be measured by the ton with deductions made for the weight of moisture above 8-percent.

The following is added at the end of this section:

Shoreline excavation will be measured by the cubic yard. All excavated material will be measured in the position it occupied before the excavation was performed. An original ground measurement will be taken using cross-section or digital terrain modeling survey techniques. For shoreline excavation items, the original ground will be compared with the planned finished grading shown in the Plans. Slope/ground intercept points defining the limits of the measurement will be as staked. When the Contracting Agency requires excavated material to be stockpiled, re-excavated and moved again, a second measurement will be made, adding quantity for the same item used in the original excavation. The second measurement will be a comparison of the original cross-section of the stockpile with a cross section of the stockpile area after the second excavation is completed.

2-03.5 PAYMENT

The following is added at the end of this section:

Payment for constructing rain gardens shall be per unit bid prices for applicable bid items. Pond Excavation Incl. Haul shall be paid per cubic yard.

Payment for hauling and placing Mineral Aggregate Type 26 (for rain garden) shall be per cubic yard.

Payment for Conveyance Ditches & Earth Berms shall be made using the applicable bid items listed in the Bid Form.

No separate payment will be made for finish grading work required to hand grade Earth Berms and Conveyance Ditches to final shape as specified.

No separate payment will be made for connection of private drain pipes to the conveyance system or rain garden.

Sand Drainage Blanket shall be interpreted to mean “Sand/Gravel Blanket” and be paid per ton.

“Shoreline Excavation”, per cubic yard.

2-04 HAUL

2-04.1 DESCRIPTION

This section is deleted in its entirety and replaced with the following:

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This Work shall consist of transporting excavated material from its original site to its final resting place on the project or at a waste site. All imported materials shall include the costs of haul in their unit Contract prices bid. All costs and expense involved in haul will be considered included in the various bid items of the project and no additional compensation will be made.

2-04.4 MEASUREMENT

This section is deleted in its entirety.

2-04.5 PAYMENT

This section is deleted in its entirety.

2-09 STRUCTURE EXCAVATION

2-09.3(1)E BACKFILLING

The following is added after the second paragraph of this section:

All trenches within the project limits (except trenches for drains and underdrains) shall be backfilled with gravel backfill for trench, except as specified in the Plans. Gravel backfill for trench shall meet the gradation requirements for crushed surfacing top course in Section 9-03.9(3).

The following is inserted after the fourth paragraph:

Controlled Density Fill (CDF) or Controlled Low-Strength Material (CLSM) shall also meet City of Seattle material requirements:

Cement, ASTM C 150	Type I/II
Slurry Density, ASTM C 138	65 pcf (minimum)
Foamed Slurry Density, ASTM C 138	45 pcf (minimum)
Water/Cement Ratio	0.90 (maximum)
Flow, ASTM C939	18 seconds (maximum)
Shrinkage, ASTM C 827	non-shrink
Bleeding, ASTM C 232	no bleed
Set Time, ASTM C 403	3-6 hours

Compressive strength

ASTM C 403 @ 24 hours	75 psi (minimum)
ASTM C 495 @ 7 Days	150 psi (minimum)
ASTM C 495 @ 28 Days	250 psi (minimum)

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Special Note: Set Time depends on temperature and site conditions.

2-12 CONSTRUCTION GEOSYNTHETIC

2-12.2 MATERIALS

The following is added at the end of this section:

Construction geotextile for Separation in the Rain Gardens shall be non-woven 40 mil HDPE with fused seams. The top edge of the liner shall be anchored according to manufacturer's recommendations.

Geotextile for Underground Drainage in the Rain Gardens shall be Moderate Survivability Drainage Class C.

Geotextile wrapping for underdrains in the Rain Gardens shall be Geotextile for Underground Drainage Moderate Survivability Drainage Class C.

Construction Geotextile for Separation for the erosion control Process Water Trap shall be a 40 mil HDPE non-woven liner.

Construction Geotextile for Underground Drainage under the North and South Basin Outfalls shall be Moderate Survivability Drainage Class C.

PVC Soil Contamination Barrier for separation at the south shoreline riverbank restoration shall be a 30 mil polyvinyl chloride (PVC) non woven fabric and shall meet the following requirements:

Certified Properties	**Test Method**	**Requirement**
Thickness ±5%	ASTM D 5199	.030"
Tensile - lb. force/in. width, min.	ASTM D 882	73
Elongation at Break (%, min.)	ASTM D 882	380
100% Modulus- lb. force/in. width, min.	ASTM D 882	30
Tear Strength (lb./in., min.)	ASTM D 1004	8
Dimensional Stability (% change max.)	ASTM D 1204	3
Impact Cold Crack (°C)	ASTM D 1790	-29

Index Properties:	**Test Method**	**Requirement**
Specific Gravity (min.)	ASTM D 792	1.20
Water Extraction (%, max.)	ASTM D 1239	0.15
Volatile Loss (%, max.)	ASTM D 1203(A)	0.70
Resistance to Soil Burial (% change max.)	ASTM G 160	
1. Breaking Factor		5
2. Elongation at Break		20
3. Modulus at 100% Elongation		20
Hydrostatic Resistance (psi, min.)	ASTM D 751(A)	100
Plasticizer Min. Ave. Molecular Weight	ASTM D 2124	400

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Minimum Specifications for EPI Factory Fabricated Seams:	Test Method	Requirement
Peel Strength, lbs/in. width	ASTM D 7408	15
Shear Strength, lbs/in. width	ASTM D 7408	58.4

2-12.3 CONSTRUCTION REQUIREMENTS

The following is added at the end of this section:

Install PVC Soil Contamination Barrier as shown in the Plans. PVC Barrier shall be installed vertically as a curtain in a 4 foot deep, 12 inch wide trench. Bury top edge with 4 inch tall berm as shown. All seams shall be vertical and must overlap a minimum of 18 inches. Compact backfill soilds in 12 inch lifts to a compaction rate of 85%.

2-12.4 MEASUREMENT

The following is added at the end of this section:

PVC Soil Contamination Barrier will be measured by the square yard for the ground surface area actually covered.

2-12.5 PAYMENT

The following is added to the list of items in this section:

"PVC Soil Contamination Barrier," per square yard.

2-13 EARTHQUAKE DRAINS (NEW SECTION)

2-13.1 DESCRIPTION

2-13.1(1) GENERAL

This Work consists of requirements for soil improvement beneath the South Park Bridge approach structures using Earthquake Drains. This Work consists of furnishing and placing vertical drains (Earthquake Drains) to a minimum depth of 60-feet below grade of the north embankment and to the top of the glaciomarine drift (as defined in Figure 3 of the Final Geotechnical Report) below the SEW approach structures, in accordance with the Contract Plans and this Section or as directed by the Project Engineer. The Earthquake Drain System, including spacing and size of drains, shall be designed by the Contractor. The top of the drains shall extend a minimum of 3-inches into a 12-inch-thick reservoir stone layer under the SEW approach structures. An elbow shall be attached to the top of each of the drains. The Earthquake Drain System shall be installed under the SEW approach structures footprint and shall extend a minimum of 10-feet beyond the approach structure footprint on all sides as denoted on the Contract Plans.

Provide all means as may be required to mitigate liquefaction with ground improvement for 975-year return period design level ground motions. Determine the existing site conditions and

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provide everything that may be necessary; including but not limited to specialized equipment, additional soils investigations, and all other additional means that is determined to be necessary to meet the requirements indicated. Grain size analyses and other geotechnical information about subsurface conditions underlying the project site are provided in the geotechnical report.

2-13.1(2) REFERENCES

The following reports are included as part of this Contract by reference and are available from the County for review.

a. Geotechnical Report, Phase II, South Park Bridge Project, by Shannon & Wilson, Inc., dated March 29, 2004.

b. Supplemental Geotechnical Data Report, South Park Bridge Project, King County, Washington, by Shannon & Wilson, Inc., dated April 6, 2009.

c. Supplemental Geotechnical Report, Final Design, South Park Bridge, King County Washington, by Shannon & Wilson, Inc., dated July 17, 2009.

The reports will be provided on the Builders Exchange of Washington website through an external link from http://www.kingcounty.gov/procurement.aspx.

2-13.1(3) SUBMITTALS

The Contractor shall submit a sample of the vertical drain for testing to the Project Engineer at least 21 calendar days prior to installation. The sample of Earthquake Drain material shall be at least 2-feet long. At the same time, the Contractor shall submit details of the sequence and proposed method for installation, including equipment, of the earthquake drain to the Project Engineer for review. Review by the Project Engineer shall not relieve the Contractor of the responsibility to install Earthquake Drains in conformance with the Contract Plans and this Section.

The Contractor shall submit a working drawing to the Project Engineer that shows planned locations of Earthquake Drains in conjunction with all existing utilities. The Contractor shall resolve any conflicts between the locations of Earthquake Drains and utilities prior to submission.

Prior to the installation of earthquake drains within the designated area, demonstrate that the equipment, method, and materials produce a satisfactory installation in accordance with this Section. The method statement shall include procedures that shall be used when working next to existing utilities and buildings so that they will not be damaged.

The Contractor shall submit qualifications to the Project Engineer showing the earthquake drain installer performing the work has a minimum of 3 years experience and a record documenting five recent, successful projects completed with specific application to these site conditions and improvement criteria. The Contractor shall provide references attesting to this requirement upon request.

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2-13.3(4) PRECONSTRUCTION CONFERENCE

An Earthquake Drains System preconstruction conference shall be held at least 5 working days prior to the Contractor beginning any Earthquake Drain construction work at the site to discuss construction procedures, personnel, and equipment to be used, and other elements of the approved drain installation plan as specified in this section. Those attending shall include:

a. Representing the Contractor: The superintendent, on-site supervisors, and all foremen in charge of installing the drains.

b. Representing the County: The Engineer.

If the Contractor's key personnel change, or if the Contractor proposes a significant revision of the approved earthquake installation plan, an additional conference shall be held before any additional drain installation operations are performed.

2-13.2 MATERIALS

Earthquake drains shall consist of prefabricated corrugated plastic pipe materials with slot-type perforations encased by filter fabric conforming to the following requirements:

2-13.2(1) PIPE

The pipe shall have an annular-corrugated interior and exterior. Pipe shall be a minimum of 3-inch and maximum of 8-inch I.D., and shall meet the requirements of ASTM F 405. All pipe sizes shall also meet the requirements of SCS 806. Pipe material shall be high-density polyethylene (HDPE) meeting the requirements of ASTM D 3350, Cell Classification 324420C; or ASTM D 1248 Type III, Class C, Category 4, Grade P33. Pipe splices shall be made in a workmanlike manner, so as to assure concentricity and continuity of the pipe conduit.

2-13.2(2) FILTER FABRIC

The filter fabric sock shall be non-woven and made of thermally spun-bonded polypropylene with minimum weight of 3.9-oz/ft^2, maximum apparent opening size (AOS) of U.S. No. 70 (0.0083 in), minimum grab strength of 100-lbs, and shall be factory applied. The prefabricated vertical drain shall not be exposed to sunlight for more than 72 hours.

2-13.2(3) RESERVOIR STONE

The drainage layer shall consist of reservoir stone meeting the requirements for AASHTO Grading No.4 as specified in Section 9-03.1(4)C. A geotextile, such as Mirafi 140N or equivalent shall be installed underneath the reservoir stone layer.

2-13.3 CONSTRUCTION REQUIREMENTS

2-13.3(1) INSTALLATION

Install prefabricated vertical drains using a mandrel that shall be advanced through the soil to the required depth. The installation rig shall be capable of utilizing a vibrator with an eccentric moment of at least 500-in-lbs. to apply vertical vibration to the mandrel during installation. The mandrel shall be fitted with three symmetrically spaced fins for transmitting vibrations to the soil

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during installation. At locations within 50-feet of existing buildings, the existing bridge and vibration sensitive facilities as indicated on the Plans or identified by the Engineer, a mandrel without vibration or fins shall be used. At locations within 20-feet of the existing bridge approach embankment, existing bridge abutments and settlement sensitive facilities as indicated on the Plans or identified by the Engineer, a mandrel without vibration or fins shall be used. Attach suitable shoe or lost point to the bottom of the drain to provide an anchor for the drain and to cover the lower open end of the mandrel during penetration. The mandrel shall protect the drains and filter sock from tears, cuts, and abrasions during installation and shall be retracted after each drain is installed. Provide equipment capable of exerting at least 12-tons of vertical force (static crowd) to the mandrel to aid in forcing the mandrel into the ground.

A drain may be abandoned before reaching design penetration if the rate of mandrel movement is less than 3-inches per second with the full static force and maximum vibrator output. Falling weight impact hammers or jetting will not be allowed for installing vertical drains; however, limited amounts of water may be introduced into the mandrel to facilitate anchoring of the drains. Augering auger or other methods to loosen stiff upper soils prior to installation of the earthquake drains shall be permitted, provided such augering does not extend more than 2-feet into the underlying liquefiable soils.

Where obstructions are encountered which cannot be penetrated using normal and accepted procedures, complete the drain from the elevation of the obstruction to the work surface and notify the Project Engineer. At the direction of the Project Engineer, install a new drain within 18-inches of the obstructed drain. A maximum of two attempts shall be made, as directed by the Project Engineer, for each drain at no additional cost to the County.

Plumb equipment for installing vertical drains prior to installation of each drain. Drains shall not deviate from the vertical by more than 1-inch per foot during installation. Number and stake earthquake drain locations for review by the Project Engineer prior to start of installation. Take all reasonable precautions to preserve the stakes. The location of the drains shall not vary by more than 6-inches from locations indicated on the working drawings or as directed by the Project Engineer. Install drains to the limits of the ground improvement areas as shown on the Contract Plans. Drains that are out of the proper location or damaged will be rejected. Rejected drains may be abandoned in place or removed at the Project Engineer's option without additional cost.

Observe precautions necessary for protection of instrumentation devices. After instrumentation devices have been installed, replace any equipment that is damaged or becomes unreliable as a result of Contractor negligence at no additional cost to the County.

Provide the Project Engineer with suitable means of determining the quantity of Earthquake Drains installed at each location and provide suitable means for the Project Engineer to determine the depth of the drain at any time.

Cut off drains 3-inches above the bottom of the reservoir stone under the structure and asphalt surfaces and at grade in other areas. Attach an elbow to the top of each drain. Prevent reservoir stone from entering the drain upon the subsequent backfilling of drain rock.

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2-13.3(2) INSPECTION

Each drain shall be inspected to verify that no blockage exists at the top of each drain.

Sampling and testing for gradation of "Reservoir Stone" will be performed for every 200-cubic yards of used material. Gradation test report shall be submitted within 24 hours of the completion of each test.

2-13.3(3) ACCEPTANCE CRITERIA

A. Minimum Criteria

The completed earthquake drains system installation shall contain earthquake drains that are no less than the number, spacing, area of coverage, and depths of installation shown on the working drawings submitted and reviewed in accordance with this Section.

2-13.3(4) DAILY LOGS

For each earthquake drain, the Contractor shall keep a record of the location and maximum penetration depth and record refusal and/or any unusual occurrences during installation. The Contractor shall submit a daily log to the Project Engineer which includes: recording drain number, start/finish time of probe, vibration equipment identification, and depth of installation.

2-13.4 MEASUREMENT

No unit of measure shall apply to lump sum price for Earthquake Drain Systems.

The “Earthquake Drains System” contains the following approximate quantities.

Item	Approx. Quant.	Unit
Structure Excavation Class B incl. Haul	3,920	CY
Streambed Cobbles	820	CY
Quarry Spalls	820	CY
Earthquake Drains	49,000	CY

The quantity is provided only for the convenience of the Contractor in determining the volume of Work involved and is not guaranteed to be accurate. The prospective bidders shall verify the quantity before submitting a bid. No adjustments other than for approved changes will be made in the lump sum Contract price for “Earthquake Drains System” even though the actual quantity may deviate from those listed.

2-13.5 PAYMENT

Payment will be made in accordance with Section 1-04.1, for the following:

1. “Earthquake Drains System", per lump sum.

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The lump sum Contract price for "Earthquake Drains System" shall be full pay for all costs of furnishing the full length of drain material, installing the drain including excavation, backfilling, coordination, testing, cleanup, and permit fees, altering equipment and methods of installation in order produce the required end result in accordance with the Contract Plans and as described in this Section, and shall also include the cost of furnishing all tools, materials, labor, and all other costs necessary to complete the Work. No payment will be made for unacceptable drains or for any delays or expenses incurred through changes necessitated by improper or unacceptable material or equipment.

2-14 BRIDGE MONITORING (NEW SECTION)

2-14.1 DESCRIPTION

2-14.1(1) GENERAL

This item of Work consists of furnishing, installing and maintaining monitoring of the existing South Park Bridge movements and vibrations during construction of the caisson cofferdams, temporary trestle and caissons. The Contractor shall continuously monitor existing bascule piers for settlement, translation and vibration from a period of time starting 21 calendar days prior to placement of the temporary construction trestle piles or caisson cofferdams, whichever occurs first, through completion of the caisson caps, removal of the caisson cofferdams, or removal of the temporary construction trestles, whichever occurs later.

If alterations in the Work are determined to be necessary by the Project Engineer based on monitoring, changes will be implemented in accordance with 1-04.4.

2-14.1(2) INSTRUMENTATION SPECIALIST

The Contractor shall perform all monitoring work described in this Special Provision, including procurement, under the direct supervision of an Instrumentation Specialist retained by the Contractor and approved by the Project Engineer. The Instrumentation Specialist may be an independent individual or employee of an engineering firm, testing laboratory, or similar organization, and shall not an employee of the Contractor. The Instrumentation Specialist shall have a minimum of five years experience designing, installing, and monitoring instrumentation systems similar to those described in this Section. Demonstrate experience by resume and references.

2-14-1(3) PROJECT CONDITIONS

Monitoring data shall become the property of the County and are not to be disclosed to third parties or published without written permission of the Project Engineer. Data developed shall be immediately available to the Project Engineer and Contractor. The County will procure access agreements to Boeing properties for the Contractor's personnel. The Contractor shall provide information as requested in order to satisfy Boeing's requests for information.

Delays in schedule due to the Contractor's actions shall not constitute a basis for schedule or cost adjustments of any kind.

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2-14.1(4) DEFINITIONS

Maximum Level: Maximum allowable value for a specific instrument.

Trigger Level: Intermediate value less than the Maximum Level for a specific instrument that serves as a trigger for additional consideration of construction activities to be implemented.

2-14.2 MATERIALS

2-14.2(1) GENERAL

Verify all monitoring devices and equipment is the manufacturer's standard products without modifications.

Ensure all monitoring devices, except survey equipment, and others which cannot be readily automated, are fully compatible with the datalogger and associated software described in this Special Provision, without loss of accuracy or function.

Unless otherwise indicated, only use signal cables for instruments provided by the manufacturer of the associated instrument and suitable for the expected environment. Do not splice cables between the instrument and datalogger unless absolutely necessary.

2-14.2(2) TILT METERS

The Contractor shall utilize two existing tilt meters and associated power cables, data cables and power supplies presently owned by the County and installed the bascule piers of the existing bridge.

2-14.2(3) AUTOMATED MOTORIZED TOTAL STATION SYSTEM

The Contractor shall provide two fully automated motorized total stations (AMTS) monitoring units under computer control, in conjunction with high quality precision optical survey prisms to provide real-time movement monitoring at locations identified on the three piers. The system shall provide the means to remotely monitor the three components of movement of precision targets mounted on the bridge piers. The total station monitoring unit shall be model TM30 1 second instrument manufactured by Leica, or approved equal. The software shall be able to filter out erroneous data points due to construction activities and traffic. The software package and any assumptions required for this data reduction process shall be submitted to the Project Engineer for approval. The procedures and method of correction shall be submitted to the Project Engineer for approval.

A. The monitoring system shall provide three-dimensional displacement vectors for all of the survey prisms with measurement precision of plus or minus 1 millimeter for sight distances up to 200 meters.

B. The monitoring system shall be capable of providing temperature readings that coincide with the instrument readings. The monitoring system shall correct the monitoring data due to temperature and pressure variations in real time.

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C. The monitoring system shall be capable of recognizing self movement of each total station unit and correcting the data of the monitoring targets in real time. A minimum of three control targets for each total station monitoring unit shall be set up on sturdy structures that are outside the zone of construction influence. The locations of the control targets shall be determined so that movement of the total station unit (x, y, and z axis) can be calculated by monitoring data from the control targets. The control targets shall be read by the total station monitoring units for each cycle of monitoring and the target monitoring data shall be corrected for self movement of the total station units immediately after each cycle of monitoring.

D. The monitoring system shall be configured to form a global network of all total station monitoring units with the use of common targets monitored by the total station units. Each total station monitoring target shall have a minimum of two common targets that are monitored by another total station unit. The monitoring system shall have the optional ability to process a global least squares adjustment of data that are acquired by several total station monitoring units in the network so that one or more total station units can use other control targets associated with a different total station unit. The adjustment shall be calculated immediately after the each cycle of monitoring.

E. The system used shall provide the Project Engineer access to both the electronic raw data and processed data at any time and allow the Project Engineer to download the data. The processed data shall include all tables, plots and graphs necessary to display each component of displacement. The monitoring software shall provide a web page module that allows all data to be viewed over a customizable web interface.

F. The total station(s) installed for this system shall be able to triangulate their position based upon reference survey targets. These reference survey targets shall be installed as part of the AMTS. The location of the reference survey targets shall be submitted to the Project Engineer for approval.

G. The AMTS shall report movements/deformations at the survey prisms as determined by the Project Engineer, to the Instrumentation Data Management System.

H. The AMTS shall be capable of reporting deformations for all of survey points in less than 2 hours.

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2-14.2(4) VIBRATION MONITOR

The Contractor shall monitor vibrations of both existing bascule piers during the construction activities identified with this Special Provision. A vibration recording device shall be placed on or within the existing bascule piers closest to the westerly face as practical. Monitor particle velocities to the nearest 0.01 inch per second and frequencies to the nearest 0.1 cycle per second.

2-14.2(5) DATA LOGGER

The Contractor shall provide a datalogger capable of reading all monitoring devices described in this Special Provision complete with input, output, signal conditioning, communications, and other hardware for a complete and functional system, including but not limited to: multiplexers,

local input/output connection for laptop computer, and telephone modem. Mount the datalogger in a protective enclosure that will accommodate each manufacturer's enclosures for components of the system. Provide mounting posts, concrete, and other materials / equipment for the protective enclosure as required for complete, reliable, and durable system over the duration of monitoring. Provide a continuous, adequate power source free of voltage transient surges/sags for the data logger in accordance with the manufacturer's recommendations.

2-14.2(6) INSTRUMENT DATA MANAGEMENT SYSTEM

The Contractor shall provide an instrument data management system (IDMS) capable of comparing the output of each monitoring device, in engineering units, against Project Engineer-selected alarm limits, and electronically relaying hourly logged readings to the Project Engineer office, the County's office and third office located within 30 miles of the Project Site. At each of these locations, provide a visible (e.g., warning light) and audible alarm system to be actuated if the Trigger or Maximum Level Instrument Response Value for the particular instrument is exceeded. The Contractor shall provide that the alarm system have 24 hour connection to three pagers, to be assigned to the Contractor the Project Engineer and the Project Engineer's representative.

The IDMS shall be capable of storing and disseminating all data from monitoring devices associated with instruments described in this Special Provision. It shall be provide automated processing of the instrumentation data to convert readings into meaningful engineering units, displays graphs of instrumentation data, generates reports of monitoring data. Access to the information shall be controlled.

2-14.3 CONSTRUCTION REQUIREMENTS

2-14.3(1) GENERAL

Allow time for and include all instrumentation installation, monitoring, baseline readings, and associated work in the construction schedule.

Install all instrumentation complete and functional to the satisfaction of the Project Engineer. Replace unsatisfactory instrumentation or associated equipment at Contractor's expense.

Notify the Project Engineer at least seven calendar days prior to the start of work.

The monitoring equipment shall remain the property of the Contractor and shall be removed from the Project upon completion of the monitoring activities.

The Contractor shall be responsible for safety during all instrument installation and monitoring activities. Conduct all instrumentation activities in accordance with applicable Federal, State, and local regulations and all project-specific health and safety plans. Where conflicting requirements are encountered, the most stringent shall apply.

2-14.3(2) INSTRUMENTATION INSTALLATION

The Contractor shall provide a schedule and outline of procedures and timing for installation of the monitoring devices. Provide a summary table for all instrument installations by number and

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location showing timing of installation, initial monitoring readings schedule. Provide manufacturer's descriptive literature, including technical specifications, for proposed instruments, manufacturer's literature on protective enclosures, detailed manufacturer's literature on installation procedures for each instrument, including cable and locations, and methods for protecting instruments during construction. Provide calibration certificates for each instrument. Verify calibration sheets, and include at a minimum the zero correction value, the gauge factor, temperature correction factor, and calibration data at the time of manufacture.

Provide Sample reports for each instrument type indicating:

A. Description of the instruments to be used.

B. Description of installation procedures.

C. Plan showing proposed instrumentation locations, locations of data loggers or computers, cable routing to data loggers or computers, communication systems (if used)

D. Schedule of Instrumentation Installation.

2-14.3(3) CALIBRATION

Calibrate all monitoring devices prior to installation,

Verify calibration results are within the tolerances for the particular instrument as listed on the manufacturer's standard published data sheet for that instrument. Monitoring devices with calibration results that do not fall within the specified tolerances will be rejected,

Recalibrate monitoring devices, readout units, and other equipment that is used for monitoring on an on-going basis at the manufacturer's recommended intervals, or whenever, in the opinion of the Project Engineer or the Contractor, there is reason to suspect that the associated data is being affected by calibration changes or errors.

Perform all calibration in accordance with the instrument manufacturer's recommended methods.

Ensure calibration equipment and standards are traceable to National Institute of Standards and Technology standards and are themselves in current calibration. Submit evidence of traceability and calibration of standards to the Project Engineer upon request.

Confirm proper function of all monitoring devices upon completion of installation.

Make readout units available to the Project Engineer to verify proper function and monitoring of instrumentation.

2-14.3(4) INSTALLATION SCHEDULE

Install all monitoring devices and make operational, with stable baseline readings prior to the start of the identified work.

Obtain at least 3 sets of baseline readings prior to the start of identified work activities.

Verify baseline readings agree to within the accuracy of the instrument.

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Do not begin construction activities without written approval from the Project Engineer.

Portable readout units may be used for testing instrument function prior to connection with datalogger and at other times as necessary. However, implement fully automated (datalogger) reading function prior to the start of construction of the associated feature.

2-14.3(5) PROTECTION

Provide at installation protective enclosures, plates, cable conduit, and other equipment as required to protect the instrumentation system from damage during construction.

The Contractor shall at own expense for repairing or replacing instruments or associated components that are damaged during construction, as directed by the Project Engineer.

Route all signal cables to the corresponding readout station inside of protective conduit.

2-14.3(6) MAINTENANCE

Maintain all instrumentation in accordance with manufacturer's recommended procedures and schedule, or as directed by the Project Engineer.

Replace damaged installations which are the result of the Contractor's operations immediately.

Report all damaged or non-functional instrumentation to the Project Engineer.

If an instrument is repaired, replaced, or moved subsequent to installation, record new: instrumentation type, as built location, and calibration sheets. Report to the Project Engineer the reason the original instrument was altered and the date the new instrument was operational.

2-14.3(7) INSTRUMENT MONITORING

The Contractor shall monitor the existing bridge in accordance with the following:

A. Initial Readings:

1. Obtain initial readings from all instrumentation.

2. Provide initial readings by conducting three separate and complete sets of readings on each instrument. Readings shall be taken with sufficient accuracy to produce similar results in each of the three readings.

3. Submit data via electronic copies and paper copies from all other instrumentation within 24 hours after the readings are taken.

B. Baseline Readings,

C. Routine Monitoring Readings,

D. System Maintenance,

E. Action Level Values:

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1. Action Level values will be provided by the Project Engineer and may be altered during the course of construction by the Project Engineer.

2. When monitoring data has exceeded the Action Level values implement the following procedures specified herein.

3. Exceeding Action Level Values:

   a. Trigger Level: Verify measurement and notify the Project Engineer immediately after obtaining measurements that exceed the Trigger Level for that instrument. Double the frequency of monitoring devices until movements have stabilized or as directed by the Project Engineer. Implement procedures to limit further movements as directed by the Project Engineer.

   b. Maximum Level: Verify measurements and notify the Project Engineer immediately after obtaining measurements that exceed the Maximum Level for that instrument. For all values exceeding those indicated, and depending on conditions, the Project Engineer may suspend construction activities.

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2-14.3(8) SUBMITTALS

The Contractor shall submit to the Project Engineer for review and approval the following:

A. Instrumentation Installation and Monitoring Plan,

B. The procedures and method of AMTS correction,.

C. Qualifications of Instrumentation Specialist,

D. Within 5 working days after approval of each instrument type, two sets of operating manuals for each type of instrument, including read-out devices and appurtenant equipment required for a complete installation,

E. Within 5 working days after completion of installation of each instrument, submit location data,

F. Baseline values for each instrument posted electronically to the IDMS

G. Data obtained during the monitoring posted electronically to the IDMS.

2-14.4 MEASUREMENT

No unit of measure shall apply to the lump sum price for Bridge Monitoring

2-14.5 PAYMENT

Payment will be made in accordance with Section 1-04.1, for each of the following

"Bridge Monitoring", lump sum.

The lump sum Contract price for “Bridge Monitoring” shall be full pay for all costs in connection with furnishing all materials, labor, tools, and equipment necessary for the manufacture, fabrication, transportation, installation, commissioning, monitoring activities and maintenance of all bridge monitoring as shown and noted in the Plans and as required or inferred by these Special Provisions and in the Standard Specifications.

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SURFACE TREATMENTS AND PAVEMENTS

5-04 HOT MIX ASPHALT

5-04.2 MATERIALS

In reference to this section, the grade of paving asphalt shall be HMA Cl. ½" PG 64-22.

5-04.3(3) HOT MIX ASPHALT PAVERS

The following is added at the end of this section:

For any course of hot mix asphalt (HMA) used in traffic lanes with a depth of 0.08 feet or greater the direct transfer of the HMA from the hauling equipment to the paving machine will not be allowed. A material transfer device or vehicle (MTD/V) shall be used to deliver the HMA from the hauling equipment to the paving machine.

The MTD/V shall mix the HMA after delivery by the hauling equipment but prior to laydown by the paving machine. Mixing of the HMA shall be sufficient to obtain a uniform temperature throughout the mixture. If a windrow elevator is used, the length of the windrow may be limited in urban areas or through intersections, at the discretion of the Project Engineer.

5-04.3(11)A FEATHERING HOT MIX ASPHALT (NEW SECTION)

Where directed by the Project Engineer, the Contractor shall feather the HMA in a manner to produce a smooth riding connection to the existing pavement.

After application of the tack coat of asphalt, the area of the feathered joint shall be preheated using hand torches. The preheating operation shall continue during the raking process to ensure a smooth and well bonded joint.

HMA, utilized in the construction of the feathered connection to the existing pavement, shall be modified at the Contractor's plant or the commercial source from which the Contractor obtains the mix or by raking the joint, thereby removing the larger coarse aggregate, to the satisfaction of the Project Engineer.

Transverse joints shall be sealed with PG 58-22 or an approved equivalent grade of asphalt as directed by the Project Engineer.

All costs and expenses in connection with providing, placing and feathering the HMA and sealing with PG 58-22 or an approved equivalent shall be included in the unit price per ton for "HMA Cl. 1/2"PG 64-22" and no additional compensation will be made.

5-04.3(13) SURFACE SMOOTHNESS

The second sentence is deleted and replaced with the following:

The completed surface of the wearing course shall not vary more than 1/4 inch from the lower edge of a 10-foot straightedge placed on the surface parallel to centerline.

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5-04.3(14) PLANING BITUMINOUS PAVEMENT

The third paragraph is deleted and replaced with the following:

Planing shall be performed in a manner such that the underlying pavement is not torn, broken or otherwise injured by the planing operation. The surface of the underlying pavement shall be slightly grooved or roughened sufficiently to ensure a bond when overlaid. In existing single layer pavements, care shall be taken that the planing does not penetrate into the subgrade. The Project Engineer will determine the planing depth in these situations. The Contractor shall immediately remove from the project any worker who continuously and carelessly puncture the existing pavement with the planing equipment.

The fourth sentence of the fourth paragraph of this section is deleted and replaced with the following:

Unless otherwise provided, the Contractor shall provide a waste site for the disposal of these materials as specified in Section 2-03.3(7)C.

Pavement shall be planed as designated in the Plans, or as directed by the Project Engineer.

The Contractor shall coordinate planing and paving operations so that no planed area is left unpaved for more than five working days. Planing of bridge approaches shall be done on the same day as paving, unless previously approved by the Project Engineer. When approval is granted by the Project Engineer to pre-plane bridge approaches, the Contractor shall place a paper joint asphalt wedge at the bridge approach. The wedge dimensions shall be as directed by the Project Engineer. Removal of the asphalt wedge for final paving shall occur within five working days. All costs for installing and removing the asphalt wedge shall be included in the unit price for planing bituminous pavement. Liquidated damages, in accordance with Section 1-08.9 of these specifications, will be deducted from monies due the Contractor for failure to pave the roadway after planing within the time specified.

5-04.3(22) HOT MIX ASPHALT FOR PRELEVELING (NEW SECTION)

HMA shall be placed to prelevel the existing roadway as shown on the typical roadway sections in the Plans in accordance with Section 5-04.3(5) of the WSDOT Standard Specifications in those areas directed by the Project Engineer.

The prelevel material shall be placed on the roadway to restore the pavement grade and cross section by filling dips, sags, wheel ruts and distorted areas within the roadway limits to be paved. The existing average slope from centerline for the roadway section shall be maintained.

Preleveling will be performed only where directed by the Project Engineer.

All costs for furnishing materials, labor, tools and equipment to prelevel the existing roadway shall be included in the unit Contract price per ton for “HMA Cl. ½” PG 64-22” and no additional compensation will be made.

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5-05 CEMENT CONCRETE PAVEMENT

5-05.1 DESCRIPTION

The following is added at the end of this section:

The pavement section shall be constructed in accordance with COSP number 402A.

5-05.3(8) JOINTS

This section is deleted in its entirety and replaced with the following:

Transverse and longitudinal joints shall be contraction or through joints (including construction joints). Joints shall be constructed in accordance with COSP number 405 and shall be of the type and at the locations indicated on the Plans. The faces of all joints shall be constructed perpendicular to the surface of the cement concrete pavement.

5-05.3(8)A CONTRACTION JOINTS

This section is deleted in its entirety and replaced with the following:

Formed Contraction Joints

Formed contraction joints shall be constructed by embedding a ¼-inch thick premolded joint material as indicated on COSP number 405. The depth of the formed joints shall be 1/3 of the pavement thickness. The filler shall be cut to the exact section of the joint. The length of the premolded joint filler shall extend to within 1/4-inch of any panel edge.

Transverse contraction joints (dummy joints) shall be placed after compaction and finishing of concrete have been completed and before initial set. A vertical groove shall be cut into the surface at the location of the joint, using a tool provided with stops (tee iron) to prevent cutting the groove deeper than the planned depth. The preformed joint material shall then be embedded into the groove until the top is flush with the pavement surface, with a deviation of not more than 1/8-inch below the surface. The joint filler shall be perpendicular to the surface and always in a straight line.

After the joint filler has been embedded in the concrete, the surface of the pavement shall be finished against the filler strip with hand floats to restore the surface finish. While performing this operation, the filler strip shall be maintained in a perpendicular position, true to the alignment. After finishing the entire area, the joint shall be true to grade, smooth and without irregularities.

The premolded joint filler may be omitted provided the joints are subsequently sawed in accordance with the following provisions in Sawed Contraction Joints.

Sawed Contraction Joints

Sawed contraction joints shall be constructed by sawing a vertical groove in the hardened concrete on an approved schedule after placing and before development of random cracks in the concrete slab. The depth of sawcut shall be 1/3 the pavement thickness and shall not cut

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underlying pavement tie bars and dowel bars (see COSP number 405). Transverse contraction joints shall be sawed before the longitudinal joints are sawed. The first set of transverse joints shall be sawed at a maximum of 60 foot intervals, as soon as the cut can be made without undue raveling of concrete. Intermediate joints shall be sawed immediately following the first set of joints. The Contractor shall provide the Project Engineer a minimum 4 hours advance notice of sawcutting.

Any scheduling for the sawing of joints that results in premature or uncontrolled cracking shall be revised immediately by adjusting the time interval between placing of concrete and the sawing of joints. After the revised schedule has been accepted by the Project Engineer, the sawing shall proceed as a continuous operation until all joints have been completed.

Two or more sawing units may be required to accomplish the sawing in order to minimize random cracking. Standby equipment shall be on the job to ensure continuity of sawing regardless of any breakdown of equipment.

Where curing membrane is used, the area disturbed by sawing of joints shall be resprayed immediately upon completion of the sawing operation and care shall be exercised to prevent the curing compound from getting into the groove. Joint sealing compound shall not adhere to concrete if curing compound is present.

The concrete saw shall be powered adequately to perform the required cutting. It shall cut a uniform groove to the required depth and not less than 3/16-inch nor more than 5/16-inch in width. The Contractor will be expected to so arrange the schedule of sawing joints, including initial sawing, at the required intervals so that every possible effort is made to control cracking by the use of judiciously spaced and timed sawed joints. In the event random cracks occur, they shall be repaired in accordance with Section 5-05.3(22). The Contractor shall provide at least one standby saw in good working order to insure continuous sawing as specified regardless of any breakdown of equipment. An ample supply of saw blades shall be maintained at the site of pavement construction at all times during sawing operations. The Contractor shall provide artificial lighting facilities for night sawing. All equipment required for sawing shall be at the pavement construction site both before and continuously during concrete placement. Sawing equipment shall be available immediately and continuously on a 24 hour basis, including Saturdays, Sundays and legal Holidays.

Damage to curing material caused by sawing operations shall be repaired immediately after completion of sawing.

Formed transverse contraction joints shall be installed where designated by the Project Engineer, if necessary to prevent uncontrolled transverse cracks from occurring before the pavement can be sawed.

Sealing Sawed Contraction Joints

Sawed contraction joints shall be filled with a joint sealant filler conforming to the requirements of Section 9-04.2. Joints shall be thoroughly cleaned at the time of sealing. If hot-poured type

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sealant is used, the joints shall be dry. Care shall be taken to avoid air pockets. The hot-poured compound shall be applied in two or more layers, if deemed necessary by the Project Engineer. The cold-poured compound shall be applied under sufficient pressure to fill the groove from the bottom to a point approximately 1/4-inch below the surface of the concrete. The joint filled with cold-poured compound shall then be covered with a strip of nonabsorptive paper at least twice as wide as the joint. The paper shall be left in place.

If contraction joints are formed with plastic strips, sealing is not required.

Excess sealing material shall be cleaned off the surface of the pavement before opening to traffic.

5-05.3(8)B THROUGH JOINTS

This section is deleted in its entirety including the title and replaced with the title above and the following:

Expansion Joints

Expansion joints are placed only where shown on the Plans. The joint alignment shall be at right angles to the pavement structure centerline unless otherwise specified in the Contract.

Longitudinal expansion joints shall be placed where shown on the Plans or where required for concrete pavement between or along retaining walls, curbs or other structures .

Expansion joints shall be constructed with premolded material, 3/4-inch in thickness, and conform to Section 9-04.1(2). They shall extend from 1 inch below the subgrade to 1 inch below the top of the pavement. Transverse expansion joints shall extend the full width of pavement structure.

The joint material shall be held accurately in place during the placing and finishing of the concrete by a bulkhead, a holder, a metal cap or any other approved method. The joint shall be perpendicular to the paved surface and the holder shall be in place long enough to prevent sagging of the material, especially on streets having steep grades.

In multiple lane construction, the joints shall be matched so as to form a continuous alignment across all lanes.

Expansion joints shall extend continuously through all curbs, special care being exercised to preserve alignment perpendicular to the pavement in the curb section.

A wood filler strip or metal cap shall be placed on the top of the premolded joint filler to form the groove 1 inch deep, and it shall remain in place until after the finishing and the concrete is sufficiently set to resist sloughing into the groove. The joint filler shall be stapled together at the ends to preserve continuity.

Immediately after removal of side forms, the edges of the pavement shall be carefully inspected and wherever the joint filler is not fully exposed, the concrete shall be chipped down until the edge of the filler is fully exposed for the entire depth.

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Construction Joints

All longitudinal construction joints shall be constructed with keyway and tie bars as detailed on COSP number 405. Along with keyway and tie bars, a thickened edge shall be required on pavements less than 9 inches in thickness for Type B joints, and less than 10 inches thickness for Type A joints.

Transverse construction joints formed by placing a header board transversely across the subgrade shall be made at the end of each day's paving or when placing of standard mixed concrete is discontinued for more than 60 minutes or when placing of high early strength concrete is discontinued for more than 30 minutes. The header board shall be located to conform to the spacing for the transverse contraction joints (or an expansion joint) and shall be left in place until the paving is resumed. If the location of the header board is to be a contraction joint, then the header shall have fastened to the concrete side a wedge-shaped strip of wood or preformed plastic to form a key in the concrete. Thickened edge shall be constructed at the construction joint header to provide ample depth of concrete above and below the keyway. For dowel bar requirements, see Section 5-05.3(10).

Where preformed contraction joints are used, the joint made by the construction joint header shall have a 2-inch strip of joint material imbedded against the hardened concrete when paving is resumed.

Sealing Through Joints

After the pavement is cured, and before carrying any traffic, the space left by the removal of the wood filler strip or the metal cap above the top of the expansion joint filler strip shall be thoroughly cleaned of all loose material. The 3/4-inch wide groove shall be completely free of any projecting concrete from the sides and the groove shall be continuous across the slab to each edge. It shall then be filled level with the pavement surface with joint sealant meeting the requirements of Section 9-04.2(2).

The joint sealant material shall be heated and placed in accordance with the manufacturer's instructions. Burned material will be rejected. The through joint groove shall be dry at the time of pouring the sealing compound.

5-05.3(8)C JOINT LOCATION

This section is deleted in its entirety including the title and replaced with the title above and the following:

Transverse Joints

Standard spacing of transverse contraction joints along straight sections of pavement structures (between through expansion joints or between intersections or other irregular areas), shall be at intervals no greater than 15 feet across the full width of the pavement structure and at right angles to the center line of Traveled Way. Where the spacing between transverse through expansion joints or between intersections or other irregular areas are not in even multiples of 15

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feet, the last several spaces approaching the expansion joint or header shall be varied by shortening the spaces. The Contractor shall give advance notice to the Engineer and coordinate the spacing. On horizontal curves, the joint spacing of 15 feet shall be measured along the outer edge of the outside lane and at right angles to the center line.

When paving adjacent to existing pavement or a previously paved lane, the new transverse joints shall be placed to match joint locations in the adjacent pavement. Where the existing joint spacing is greater than 15 feet, intermediate transverse joints shall be constructed. The Contractor shall give advance notice to the Project Engineer and coordinate the spacing.

For intersections and other irregular areas, the arrangement of contraction joints shall be in accordance with standard intersection patterns. The area of any one irregular panel formed by contraction joints in intersections shall not exceed 225 square feet and its greatest dimensions shall not exceed 15 feet. The Contractor shall give advance notice to the Project Engineer and coordinate the spacing.

Where uncontrolled cracks have appeared or exist in the adjacent lane, they shall be matched as nearly as possible by uniform transverse joints in the second lane. In the event uncontrolled cracks in the existing paved lane are too frequent or in random locations and impossible to match with a uniform spacing in the second lane, the two lanes shall be completely separated by 3/4-inch joint material along the length of the joint from 1/8 inch below the surface to one inch below the bottom of the concrete being placed.

Where integral curb or doweled curb is placed along the concrete pavement, premolded joint filler material shall be placed transversely across the full section of the curb in true alignment with the pavement joint, perpendicular to the pavement grade.

All joints in an intersection shall be considered transverse joints except those joints that terminate normal to the curb radii.

Longitudinal Joints

Standard locations for longitudinal joints for the following pavement widths, whether contraction or construction, shall be in accordance with the following table unless specified otherwise in the Contract.

Width Curb to Curb	Joint Locations
25 Feet	Center line
32 Feet	Center line and 10 feet each side of enter
36 Feet	Center line and 10 feet each side of center
40 Feet	Center line and 12 feet each side of center
44 Feet	Center line and 11 feet each side of center or match existing joint

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In the event the roadway is divided into two lanes, the construction joints shall be located on the center line of the roadway. In separate lane construction, a joint filler 1/4-inch by 2 inches shall be placed between the two lanes when the second lane is constructed.

5-05.3(9) CASTINGS AND STEEL REINFORCING BARS IN CONCRETE PAVEMENT (NEW SECTION)

Reinforcing steel bars shall be used to reinforce concrete pavement and rigid base around COSP numbers 230 and 361 castings except when the casting crosses or is less than 18 inches near any pavement joint. A casting 18 or fewer inches clear from any pavement joint shall have 2 squares of steel reinforcement (rebar) placed around the casting at mid-depth of the concrete pavement slab. No. 4 rebar shall be used to form the 2 separate squares with the squares rotated 45 degrees from each other. The clearance of any rebar from the casting shall be a minimum of 2 inches to a maximum of 6 inches. Each set of 4 rebars shall have rebar length such that each bar is lapped at each end with connecting bars with 3 inch overlap. In no case shall any rebar be within 3 inches of any pavement joint.

5-05.3(10)A DOWEL BARS (NEW SECTION)

Dowel bars will be required in new pavement at all transverse joints of arterials, intersections, and bus and commercial non-arterials. The dowels shall be installed at the midpoint of the thickness of the pavement, parallel to the surface of the pavement and perpendicular to the transverse joint. The tolerances for placement shall be 6 1/8-inch. The size and spacing of dowel bars shall be as indicated on COSP number 405. The dowel bars shall be held in place during the placing and setting of the concrete. Dowel bars are not required between new pavement and existing pavement, unless otherwise indicated in the Contract. Joints normal to curb radii will not require dowel.

The dowels shall be installed by method of seating the dowels or by use of a dowel bar cage extended across the width of the transverse joint or by other methods approved by the Project Engineer. Dowel bars shall be coated with grease to prevent corrosion and dowel seizure. The grease coating on the dowel bars shall remain intact after installing and placing the concrete. Where dowel cages are used to support the dowels, the metal rod or wire ties used to hold the cage together during shipping shall be totally removed after the cage has been placed and secured to the base or subgrade and prior to the placement of the concrete material.

5-05.3(10)B TIE BARS (NEW SECTION)

Tie bars shall be placed at all longitudinal construction joints in accordance with COSP number 405. Tie bars are not normally required at longitudinal contraction joints or longitudinal joints between new and existing pavement unless otherwise indicated in the Contract. Tie bars shall be located at the required elevation and spacing shown on the Plans and placed in such a manner

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that the vertical edge of the concrete is not deformed or damaged during placement of the bars. Joints normal to curb radii will not require dowel.

5-05.4 MEASUREMENT

Third and Fourth paragraphs in this section are deleted and replaced with the following:

Tie bars and dowel bars required for pavement and curbs, and reinforcing steel for castings will not be measured.

5-05.5 PAYMENT

The payment statement for Cement Conc. Pavement is deleted and replaced with the following:

The unit Contract price per cubic yard for "Cement Conc. Pavement" shall include saw cutting and sealing joints, furnishing and installing dowel and tie bars, including dowel and tie bars drilled into cement concrete pavement.

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STRUCTURES

6-01 GENERAL REQUIREMENTS FOR STRUCTURES

6-01.5 WORK ACCESS AND TEMPORARY STRUCTURES (NEW SECTION)

Work Access

The Contractor shall provide, design, fabricate, construct, maintain and remove work access facilities to accommodate all work within the Duwamish Waterway and from the shorelines to the Duwamish Waterway. The Contractor shall provide, construct and remove the work access facilities in accordance with all environmental regulations and permits, including those specified in Sections 1-07.5 and 1-07.6.

The configuration and extent of the work access will be at the Contractor's option provided the access conforms to the requirements of the Contract. The work access is anticipated to include, but not be limited to: temporary construction trestles/bridges, temporary demolition trestles/bridges, cofferdams and as necessary for construction other than caisson cofferdams, temporary sheeting as necessary for construction unless noted otherwise, temporary noise attenuation piles (TNAP) and construction support provided by marine vessels.

Caisson cofferdam requirements are addressed in Section 6-22 of these Special Provisions.

Submittals

The Contractor shall submit working drawings and associated executable computer aided drafting (CAD) files of the work access to the Project Engineer for review and comment.

If the Contractor chooses an access alternative using a work trestle structure, the work access submittal shall include six sets of working drawings and two sets of design calculations prepared in accordance with Section 6-01.9. The Contractor shall design the work access structure to withstand all applicable loads in accordance with the Contractor's means and methods of construction and accepted design codes. The Contractor shall specify the design code(s) in the design calculations and working drawings.

The Contractor shall include information with the work access submittal on the construction equipment that will be utilized. The Contractor shall specify the type and model of construction equipment to be used, and shall include equipment catalogue cuts with capacities and geometry. The Contractor shall include anticipated wheel or track loads, axle spacing, outrigger geometry and reactions, crane pick angles and reach, and other equipment details.

The Contractor shall provide TNAP design, shop drawings and operation parameters to the Engineer within 30 calendar days of Award of the Contract.

Waterway Clearance Requirements

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The work access structures shall be configured to such that they provide 62 feet clear horizontal distance from the centerline of the navigation channel to the work access structure. The bottom of the superstructure of the work access structure shall be at elevation +10.0 or higher. All waterborne debris that accumulates against the work access structure shall be removed by the Contractor on a weekly basis or as specified by the Project Engineer.

Hydroacoustic Monitoring

The County will conduct the following monitoring during impact driving of pile and use of the TNAP:

1. The County will submit a hydroacoustic monitoring plan to the US Fish and Wildlife Service at least 45 calendar days prior to impact pile driving or pile proof testing.
2. The County will provide a qualified biologist during all impact pile driving and pile proof testing and confirm the calculated pressures and flow rates at each bubble manifold ring as well as observe and report any indications of dead, injured or distressed fish.
3. The County will document the effectiveness of the TNAP through hydroacoustic monitoring of a minimum of five piles as early in the project as possible. This monitoring will include determination of the sound pressure levels (SPLs), and single-strike and cumulative sound exposure levels (SELs).
4. The County will develop and submit a monitoring report(s) to the US Fish and Wildlife Service within 60 calendar days of completing hydroacoustic monitoring. The report will include:
    a. Size and type of piles driven and proofed
    b. Description of the TNAP
    c. Impact hammer force used to drive and proof test piles
    d. Description of monitoring equipment
    e. Distance between the hydrophone and pile
    f. Depth of hydrophone
    g. Distance from the pile to the wetting perimeter
    h. Depth of water

The Contractor shall coordinate activities and operations, share information related to scheduling, impact hammer forces and other pertinent data as well as provide access to the County's personnel to conduct the hydroacoustic monitoring.

Payment

Payment will be made in accordance with Section 1-04.1 for the following bid item:

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"Work Access – Temporary Trestle", lump sum.

The lump sum Contract price for "Work Access - Temporary Trestle" shall be full pay for all costs required for constructing temporary trestles, maintaining and repairing, and removing temporary trestles in accordance with the Contract Plans. The lump sum Contract price shall also include full pay for all temporary lighting on and around trestles, mitigation during trestle construction and use, including fabrication and utilization of a TNAP, coordination with the County for hydroacoustic monitoring, maintenance cleaning, and all other costs necessary to complete the Work.

6-01.9 WORKING DRAWINGS

The first paragraph of this section is deleted and replaced with the following:

The Contractor shall submit supplemental drawings [six (6) copies] with calculations [six (6) copies] as required for the performance of the Work. The drawings shall be provided in hardcopy and executable electronic CAD (Computer Aided Design or Computer Aided Drafting) format. The hardcopy drawings shall be provided on sheets measuring 22 by 34-inches, 11 by 17-inches, or on sheets with dimensions in multiples of 8½ by 11-inches. The executable electronic CAD format drawings shall be provided in Bentley MicroStation V8 format or AutoCAD 2006 format. All drawings shall be to scale in keeping with standard drafting procedures. The design calculations shall be on sheets measuring 8½ by 11-inches. They shall be legible, with all terms identified, and may include computer printouts. The drawings and calculations shall be provided far enough in advance of actual need to allow for the review process by the Contracting Agency, which may involve rejection, revision, or resubmittal. Unless otherwise stated in the Contract, the Project Engineer will require up to 21 calendar days from the date the submittals are received until they are sent to the Contractor. No additional Contract time will be allowed for rejected submittals. Furthermore, the required Project Engineer's review time will increase if the drawings submitted do not meet the Contract requirements or contain insufficient details, requiring further revisions and Project Engineer review. The Contractor's progress schedule shall be updated to reflect an accurate accounting of project time including the Project Engineer's review and any increased time due to rejected or insufficient submittals.

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6-01.10(A) UTILITIES ON BRIDGE (NEW SECTION)

Description

The Contactor shall install five (5) rows of utility hangers and the attached concrete inserts for the following utilities on the South Approach Span: two for 8-inch diameter storm drain lines, one for a 6-inch diameter sewer line, one for an 8-inch diameter insulated fire protection and 1 ¼-inch insulated water line, and one for a conduit cluster of two 4-inch diameter and one 2-inch diameter conduits as shown in the Plans. Structural supports in the form of inserts in the bridge deck slab, hanger rods, nuts, rollers and bracings as shown on the Plans shall be furnished and installed for those utilities on the bridge deck.

The Contactor shall install five (5) rows of utility hangers and the attached concrete inserts for the following utilities on the North Approach Span: two for 8-inch diameter storm drain lines, one for a 6-inch diameter sewer line, one for an 8-inch diameter insulated fire protection and 1 ¼-inch insulated water line, and one for a conduit cluster consisting of four 4-inch diameter, two 1-inch diameter and one 2-inch diameter conduits as shown in the Plans. Structural supports in the form of inserts in the bridge deck slab, hanger rods, nuts, rollers and bracings as shown on the Plans shall be furnished and installed for those utilities on the bridge deck.

As shown in Plans utilities connect between North and South control towers via "Submarine Conduit System." See Section 8-39.

The Contactor shall install steel pipe sleeve (Coated Steel Casing (Size) In. Diam. and (Size) In. Thick) in the penetrations at the bridge abutments as shown in the Plans. Block outs and penetrations for all utility lines on the South Park Approach Spans shall be constructed as shown in the Plans.

Materials

All materials shall be new, free from defects, of current manufacture, and of the quality specified or shown.

<u>Inserts and Hanger Assemblies for Utilities on the Bridge</u>

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

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

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

Steel bars, plates, and shapes shall conform to AASHTO M 270, Grade 36 and shall be galvanized in accordance with AASHTO M 111.

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

Pre-formed fabric pads shall be composed of multiple layers of duck, impregnated and bound with high quality oil resistant synthetic rubber, compressed into resilient pads of uniform thickness. The duck shall be of highest quality cotton or cotton-polyester 50-50 blend, and shall weigh a minimum of eight ounces per square yard. The cotton warp and the filling yarn shall be 2-ply. The cotton-polyester warp and fill shall be single yarn, with a minimum breaking strength by grab method of 150 pounds per inch per width (psi) warp, and 140 psi fill. The filling count of the duck shall be 40± 2 threads per inch and the warp count shall be 50± 1 thread per inch. The number of piles shall be sufficient to produce the specified thickness, after compression and vulcanizing.

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The finished pads shall withstand compression loads perpendicular to the plane of the laminations of not less than 10,000 psi without any sign of failure after the load is removed. Failure is defined as any breakdown of the component materials or laminations. Pre-formed fabric pads shall have a shore A hardness of 90+5.

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

Steel Pipe Sleeves

See Section 9-05.10A for casings related to Storm Drain pipes.

The 18-inch, 14-inch, 12-inch and 10-inch diameter steel casings shall be of 5/16-inch thick wall steel pipe. Steel casing material shall conform to AWWA C-200, or ASTM A 53, and coating shall comply with AWWA C-204.

Construction Requirements

The Contractor shall furnish and install the bridge utility supports, and conduit pipe as shown in the Plans.

Storm Drain Lines Installation

This Work shall consist of furnishing and installing the pipe hangers for 8-inch diameter storm drain lines and 18-inch steel pipe casings in the penetrations at the bridge abutments shown in the Plans, including, but not limited to the concrete inserts, pipe hangers, expansion joints, and vaults.

Any part of Work not specifically covered by these specifications shall be in accordance with applicable sections of the Standard Specifications.

Fire Protection Lines and Water Service Lines Installation

This Work shall consist of furnishing and installing the pipe hangers for insulated 8-inch fire protection and 1 1/4-inch water service lines and 16-inch steel pipe sleeves in the penetrations at the bridge abutments shown in the Plans, including, but not limited to the concrete inserts, pipe hangers, expansion joints, and vaults.

Any part of Work not specifically covered by these specifications shall be in accordance with applicable sections of the Standard Specifications.

Sewer Lines Installation

This Work shall consist of furnishing and installing 6-inch pipe hangers and 16-inch steel pipe sleeves in the penetrations at the bridge abutments shown in the Plans, including, but not limited to the concrete inserts, pipe hangers, expansion joints, and vaults.

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Any part of Work not specifically covered by these specifications shall be in accordance with applicable sections of the Standard Specifications.

Utility Conduit Installation on South Approach Span Bridge Deck

This Work shall consist of furnishing and installing conduits, conduit hangers and steel pipe sleeve at Abutment 1. The Contractor shall install all materials to construct one line of hangers to support two 4-inch diameter and one 2-inch diameter conduits as shown in the Plans, including the concrete inserts, pipe hangers, and pipe support assemblies.

The Contractor shall furnish and install a 12-inch steel pipe sleeves in the penetrations at the bridge abutment shown in the Plans

Utility Conduit Installation on North Approach Span Bridge Deck

This Work shall consist of furnishing and installing conduits, conduit hangers and steel pipe sleeve at Abutment 6. The Contractor shall install all materials to construct one line of hangers to support two 4-inch, two 3-inch, and one 2-inch diameter conduits as shown in the Plans, including the concrete inserts, pipe hangers, and pipe support assemblies.

The Contractor shall furnish and install a 14-inch steel pipe sleeves in the penetrations at the bridge abutment shown in the Plans.

Measurement

For the purpose of payment, the installation of the pipe hangers, concrete inserts, and steel pipe will not be measured, and the payment for all Work necessary to complete the items for an accepted quantity of the supports for utilities on the bridges including furnishing and installing the utility support hangers, inserts and pipe sleeves will be included in "Superstructure-_____Approach Span," lump sum.

The installation of utility supports and steel pipe sleeves on the South Approach Bridge contains the following approximate quantities of materials and Work:

Item	Approx. Quantity	Unit
Pipe Hanger For two 8" Diam. SD Lines	70	EA
Pipe Hanger For 8" Diam. Fire Protection Line and 1 ¼-inch insulated water line	54	EA
Pipe Hanger For 6" Diam. Sewer Line	37	EA
Pipe Hanger For 2-4" and 1-2" Conduit Cluster	54	EA
Concrete Inserts	430	EA

The installation of utility supports and steel pipe sleeves on the North Approach Bridge contains the following approximate quantities of materials and Work:

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Item	Approx. Quantity	Unit
Pipe Hanger for two 8” Diam. SD Lines	70	EA
Pipe Hanger For 8” Diam. Fire Protection Line and 1 ¼-inch insulated water line	54	EA
Pipe Hanger for 6” Diam. Sewer Line	37	EA
Pipe Hanger for 4-4” Diam., 2-1” Diam. and 1-2” Diam. Conduit Cluster	54	EA
Concrete Inserts	430	EA

The quantities are listed only for the convenience of the Contractor in determining the Work involved and are not guaranteed to be accurate. The prospective bidders shall verify these quantities before submitting a bid.

Payment

All Work for block outs, penetrations, inserts, and hanger assemblies for utilities and conduit installation within the bridge limits shall be considered included in the lump sum Contract prices for the related items for “Superstructure- _____ Approach Span,” and no additional compensation will be made.

No additional compensation will be made by reason of any delay or other expense to the Contractor caused by coordination with the utility company or by installing utility company furnished items. Any unavoidable delays to the Contractor caused by coordination with the utility company or resulting from installing utility company furnished items will be addressed in accordance with Section 1-08.8.

6-01.11 NAME PLATES

This section is deleted in its entirety and replaced with the following:

This Work shall consist of furnishing and placing a bronze plaque in the bridge as directed by the Project Engineer.

Bronze shall be the best commercial quality, gold architectural bronze.

Working drawings shall be submitted to the Project Engineer showing dimensions, details of construction, arrangement, size and spacing of lettering and method of installation. Prior to casting, a full size proof rubbing shall be submitted to the Project Engineer for final checking and approval.

Border shall be a raised, rectangular pattern approximately 1/2-inch in width. Background shall be oxidized to a tablet dark color. Surfaces of lettering and border and exterior edge of border shall be machined smooth and finished to a stain or brushed finish. Letters shall be individually hand chased to obtain a crisp outline.

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Mounting shall be with blind studs threaded into the bases on the back side of the plaque. Studs shall be anchored into pre-formed or drilled holes in the concrete by means of quick setting cement. The plaque shall be mounted on the east wall of the Control Tower on Pier 4 as indicated on the Plans and as directed by the Project Engineer. Mount the plate such that it is centered 54 inches above the walkway and within a concrete border frame with 1/2 inch chamfers that is flush with the brick facing. Provide 3/8 inch clear between the concrete border and the name plate. The rim of the name plate shall be flush with the concrete border frame.

The bronze plaque shall contain the following information:

SOUTH PARK BRIDGE #3179

KING COUNTY

Department of Transportation

Road Services Division

Dow Constantine, King County Executive

(*District 8 Council Member's Name*), King County Council Member

HNTB Corporation, Designer

(*Contractor's Name*), Contractor

Date Built: January 2012

Dimensions may vary from 12" x 14" to facilitate the arrangement of the lettering, provided that plaque height does not differ by more than -5% or +25% from 10", and plaque width does not differ by more than -5% or +25% from 8".

Payment: All costs for furnishing and placing the bronze plaque in the bridge shall be considered included in the lump sum Contract price for "Superstructure – Bascule Pier."

6-02 CONCRETE STRUCTURES

6-02.2 MATERIALS

The following is added at the end of this section:

Paint

Paint shall be in accordance with Section 9-08.

Compression Seal Expansion Joint System

Compression seal glands shall be selected from the approved products listed in the WSDOT Qualified Products List, latest edition, and sized as appropriate for the compression seal expansion joints shown in the Plans.

Epoxy Crack Sealing Materials

Epoxy sealing paste shall be a thixotropic compound.

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Epoxy injection resin shall be a moisture-insensitive, two-component material capable of restoring the structural integrity of a structure by structurally bonding cracks, delaminations and hollow planes. Resin formulations shall be hydrophilic with variable viscosity to allow full depth penetration in cracks having a width of 6 mils and greater.

Epoxy injection resin, when mixed with the hardener in accordance with the manufacturer's written instructions, shall cure to a non-shrink solid material. The material shall have a normal curing time of less than 24 hours.

Epoxy injection resin shall have the following physical properties:

Solids Content, by weight (minimum) 98 percent

Viscosity (maximum) at 77F (Brookfield) 700 cps

Compressive Yield Strength (minimum) 12,000 psi

Minimum Flexural Strength (ASTM D 790) 10,000 psi

Bond Strength (minimum) 500 psi

The Contractor shall submit a sample of the material of the epoxy sealing paste and epoxy injection resin to the Project Engineer together with sufficient directions and technical data for its use. The Contractor shall not begin epoxy crack sealing operations until receiving the Project Engineer's approval of the materials selected for use, with verification from the WSDOT Materials Laboratory that the materials meet the specified requirements.

The Contractor shall submit to the Project Engineer a copy of the Materials Safety Data Sheet (MSDS) for each type of epoxy sealing paste and epoxy injection resin.

100% Submittal - Not for Construction

6-02.3 CONSTRUCTION REQUIREMENTS

The Contractor shall furnish and install the bridge utility supports, and the utility pipe or conduit pipe, as shown in the Plans. The Contractor shall notify the utility company 8 weeks in advance in accordance with 1-07.17 and shall cooperate with the utility company to install utilities on the bridge.

Concrete inserts, slab penetrations, and wall penetrations for utilities, mechanical and electrical systems shall be located to clear reinforcement. Any penetration over 2" diameter shall be submitted to the Project Engineer for review and approval.

6-02.3(1) CLASSIFICATION OF STRUCTURAL CONCRETE

The following is inserted after the first paragraph in this section:

The letter designation following the class of concrete identifies the specific use: HW for Heavy Weight concrete applications, LW for Light Weight concrete applications, MP for Mass Concrete applications and WT for Watertight applications

6-02.3(2) PROPORTIONING MATERIALS

The following is inserted after the thirst paragraph in this section:

Concrete Mixes Incorporating Fly Ash: The incorporation of fly ash into all concrete mixes used in this Project shall be considered by the Contractor in accordance with the guidelines set forth in Chapter 10.16080 of the King County Code (KCC) available at the following website: http://www.kingcounty.gov/council/legislation/kc_code.aspx.

6-02.3(5)D TEST METHODS

The following is added at the end of this section:

The Contractor shall provide sufficient curing boxes to protect all concrete test cylinders made in the field in accordance with the requirements of WSDOT FOP for AASHTO T 23. The cure box may be either a box that is field fabricated by the Contractor or a commercially available ice chest. Field fabricated cure boxes shall have a minimum 2-inch thick styrofoam insulation on all sides with an exterior made from ¾-inch plywood (minimum) or other suitable material to prevent damage to the insulation. The cure box/ice chest shall maintain the temperature of the test specimen(s) between 16°C and 27°C (60°F to 80°F). The cure box/ice chest shall be large enough to hold at least six (6) 6-inch x 12-inch concrete test cylinders. All costs for providing the cure boxes shall be included in the various items in the Contract and no additional compensation will be made.

6-02.3(6)E MASS CONCRETE (NEW SECTION)

Concrete components of the caissons, columns of Piers 2 and 5 and those portions of the bascule pier walls and caisson cap with a thickness of 3 feet or greater shall be considered Mass Concrete and the following additional requirements shall apply.

Cement complying with AASHTO M85 Type II shall be used, provided that the specified temperature limitations are met. However, the Contractor is allowed the option of using Type II low heat in lieu of Type II. Temperature of concrete at time of placement and measured at the point of discharge is limited to a maximum of 60 °F.

A combination of the mix design, components in the mix, methods of pre cooling and post cooling, if employed, and surface insulation, if used, shall limit the maximum concrete temperature and also the maximum temperature differential between any points in the interior of the concrete element and any surface of the concrete element, thereby preventing cracking.

During the period following placing concrete, the temperature differential between interior and surface shall be limited to a maximum of 45 °F; and the concrete peak temperature shall be limited to a maximum of 160 °F.

Mix designs shall achieve the required design strength without the changes in cement type and content.

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Pre cooling may be used to prevent excessive heat build-up caused by heat of hydration. Acceptable means include use of chilled water; providing some mixing water in the form of chipped, shaved, or flaked ice; cooling the aggregate; and cooling the mix with liquid nitrogen prior to placing. Ice shall be completely melted in the mix prior to concrete arrival at the job site.

Post cooling is acceptable if feasible within the parameters of the construction schedule. Piping within concrete shall be non metallic and the system shall be submitted for review of the Project Engineer.

Regardless of methods used, install temperature sensing devices within the concrete in each placement as specified in Construction Methods of this Section. The devices shall operate in the range of 32 °F to 212 °F with an accuracy of ±2 °F. The temperatures shall be recorded automatically by an approved data logger or strip chart recorder furnished by the Contractor. Connect sensing devices with armor sheathed wire. Transmit data to the Project Engineer daily.

Provide adequate concrete delivery and suitable equipment to accomplish mass concrete placements without segregation and without formation of cold joints.

Submit a Work Plan for Mass Concrete at the same time that mix designs are submitted. Include the following:

1. Mass concrete mix designs, with pertinent data pertaining to each ingredient, shall be submitted to the Project Engineer for review. Mix designs shall be verified by laboratory testing data. Final approval of the actual mix design shall be required by the Project Engineer prior to placing any concrete.

2. Temperature of Mass Concrete: The Contractor shall submit to the Project Engineer along with each mix design an analysis of the anticipated thermal and strength developments in the concrete using his/her proposed placing procedures and materials and a detailed plan indicating how temperature restrictions are to be achieved. State whether low heat cement is to be used. List anticipated temperatures that can be verified at the temperature sensor locations specified in the Construction Methods in this special provision. If cooling pipes are proposed, submit drawings and equipment data.

   Analysis shall include heat of hydration analysis for the cement; concrete strength tests; adiabatic heat signature (AHS) tests on 6 inch by 12 inch concrete cylinders; and simulation studies indicating the rate and extent of concrete temperatures, maturity and strength developed under the anticipated weather conditions, mix design, placing procedures, placing temperatures and curing methods to be used. Software and hardware required for the simulation studies shall be submitted for review by the Project Engineer.

3. A sketch of the proposed placement limits and volumes.

HQ Submittal - Not for Construction

4. Furnish mass concrete temperature records.

Placement

Notify the Project Engineer at least 48 hours prior to placement for each Mass Concrete pour.

Each lift of a placement of mass concrete shall be as indicated in the approved Contractor's submittal. The joints between successive lifts shall be bonded as directed by the Project Engineer. However curing and protection procedures described below shall be followed on each lift of placement.

Install two independent sets of three temperature sensors (total of six sensors at each location) prior to each placement of mass concrete. Install the sensors at the locations approved by the Project Engineer and adjusted where necessary to avoid reinforcing steel, cooling pipes (if used), and similar items.

Install each set so that one sensor is located 2 inches below the a surface of the concrete, one sensor is located 2 inches above the opposite surface of the concrete, and the third sensor is located midway between the first and second sensor. All 3 sensors in each set shall be aligned vertically. In elevation view, locate one set at the center of the placement, and the second set 2 feet from the edge of the concrete pour.

Furnish to the Project Engineer 8½ inch x 11 inch record sketches showing dimensioned temperature sensor locations in plan and section.

Curing and Protection of Concrete

Do not cure mass concrete with cold water that would cause the temperature differential to exceed that identified above. If the weather becomes inclement, protect the placement from excessive water from rain or snow.

Sheet curing materials shall be in accordance with Section 9-23.1. Place insulation blankets on top of the polyethylene sheets. No subsequent application of water is required provided the cover and insulation are kept tightly in place for the curing period.

Acceptance Requirements

In addition to the acceptance requirements of Section 6-02.3(5), provide temperature records documenting that temperatures do not exceed specified limits during mass concrete placement. Record internal and surface temperatures hourly until all of the following conditions are met:

1. Internal concrete temperature has dropped to less than 90 percent of the maximum recorded.

2. It can be confirmed that specified limits are not exceeded and internal concrete temperature remains within 40 degrees F of the surface concrete temp.

3. Cooling trend indicates internal and surface concrete temperatures are converging.

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6-02.3(6)F CLASS 4000HW CONCRETE (COUNTERWEIGHT CONCRETE) (NEW SECTION)

Class 4000HW concrete shall be placed in the bascule span counterweights as depicted in the Contract Plans. Class 4000HW Concrete shall consist of Class 4000 concrete matrix and shall contain steel punchings, scrap metal, billet steel, or other approved materials to achieve the average 28-day air dry unit weight specified on the Contract Plans or modified by the Contractor's balance calculations. Supplemental materials used to obtain the desired unit weight shall be uniformly distributed throughout the counterweight, shall be clean and free of oil or grease, and shall not be galvanized or coated with other materials.

The Contractor shall prepare calculations showing required dimensions and weight of the counterweight based on center-of-gravity calculations as specified in Section 6-20. The calculations shall be submitted to the Project Engineer for review. The calculations shall include summarized tabulations showing for each material the total quantity, estimated unit weight, and total weight. These estimates shall be revised based on the shipping weights of the steel. The supplemental summarized tabulations shall be submitted to the Project Engineer.

Before preparing the balance calculations, the Contractor shall cast five (5) test blocks of the Class 4000HW concrete to be used in the counterweights. The test blocks shall measure 2 feet by 2 feet by 2 feet. The test blocks shall be accurately measured and weighed immediately after casting and again 28 calendar days later to determine the net weight of the concrete test blocks. From these measurements, the Contractor shall accurately calculate the density of the Class 4000HW concrete. Test blocks shall be made and cured as specified for permanent concrete. If test blocks exhibit a tendency to swell, the concrete shall be rejected.

The density of concrete actually placed in the counterweight shall be verified by means of additional test blocks made at intervals during the placement of the concrete for the counterweight. Each block shall be weighed promptly after being made and the weight compared to the original test blocks to estimate the resulting density when cured and seasoned, and the need for adjusting the total volume of concrete to be placed in the counterweight.

The Contractor shall adjust the density of the concrete to meet the requirements at no additional cost to the County.

100% Submittal - Not for Construction

Placement

Notify the Project Engineer at least 48 hours prior to actual placement for each Class 4000HW Concrete pour.

Acceptance Requirements

Acceptance will be based on the requirements of Section 6-02.3(5), supplemented by the requirements of Section 6-02.3(6)E.

6-02.3(6)G CONCRETE CLASS 4000LW (LIGHTWEIGHT CONCRETE) (NEW SECTION)

Concrete Class 4000LW shall be used for the bridge deck and sidewalk of the moveable bascule leaves.

The Contractor shall design the concrete mixture and determining the proportions of cement, fine aggregate, coarse aggregate, water and air-entraining admixture which will produce a workable sand-lightweight concrete mix meeting the following criteria:

28 Day Air Dry Unit Weight (max.):	115 pounds per cubic foot, determined in accordance with ASTM C567
28 Day Compressive Strength (min.):	4000 psi
Slump:	2 inch +/- 1 inch (AASHTO T119)
Air Content:	6% +/- 1/2% (ASTM C173)
Cement Content (min.):	650 lbs. per cubic yard

The sand-lightweight concrete shall be proportioned by weight. It shall be designed and proportioned in accordance with the applicable requirements of ACI publications 211.2, “Standard Practice for Selecting Proportions for Structural Lightweight Concrete" and 213R, "Guide for Structural Lightweight-Aggregate Concrete". Lightweight aggregate shall meet the requirements of ASTM C330

The Class 4000LW concrete mix shall be designed by a testing laboratory, approved by the Department, retained by the Contractor and at the Contractor's expense.

The Contractor shall cast 5 test blocks of the Class 4000LW concrete to be used in the roadway decks. The test blocks shall measure 2 feet by 2 feet by 2 feet. The test blocks shall be accurately measured and weighed immediately after casting and again 28 calendar days later to determine the net weight of the concrete test blocks. From these measurements, the Contractor shall accurately calculate the density of the Class 4000LW concrete. Test blocks shall be made and cured as specified for permanent concrete.

The density of concrete actually placed in the roadway/sidewalk deck shall be verified by means of additional test blocks made at intervals during the placement of the concrete for the roadway/sidewalk decks. Each block shall be weighed promptly after being made and the weight compared to the original test blocks to estimate the resulting density when cured and seasoned, and the need for adjusting the total volume of concrete to be placed in the counterweight and/or balance plates.

The design mix, along with all the test block results shall be submitted to the Project Engineer for approval of the mix design.

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All Class 4000LW concrete shall have good workability and other properties such that proper placement, consolidation, and finishing are obtained. Lightweight aggregates and sand shall be batched by weight.

Class 4000LW concrete shall be placed, finished, cured and protected. It shall be consolidated with vibrators taking care to provide uniform consolidation without over-vibration.

The manufacturer of the Class 4000LW concrete aggregate shall supply a technical representative at the site for the first day of lightweight concrete placement operations. The representative shall be responsible to assist the Contractor and the Project Engineer in the control of lightweight concrete mixing and placement operations.

A technical report shall be submitted to the Project Engineer, by the lightweight aggregate manufacturer, regarding any observations or test results relative to the concreting practices at the work site.

No lightweight concrete shall be placed when the temperature of the concrete mixture is 90 °F, or greater. Also, no placement will be allowed if weather forecasts indicate that air temperatures of 100 °F, or greater, will occur within 4 hours of the proposed placement time.

In order to maintain a record of the strength gain of all sand-lightweight concrete placed, the Project Engineer will make standard size concrete test cylinders for compressive strength and other tests of the concrete used during the course of construction. The Contractor shall provide the concrete and molds for the test cylinders, shall be responsible for handling and protection of the cylinders on the job site, and shall arrange for delivery of the cylinders to the laboratory designated by the Project Engineer.

The cylinders will be made and cured in accordance with the requirements of ASTM C31. In general, one set of cylinders will be made for each 50 cubic yards, or fraction thereof, placed each day and/or as directed by the Project Engineer. Each set shall consist of six cylinders. Two cylinders of each set will be tested at 3 calendar days for the purpose of determining whether or not the concrete represented by the cylinders has acquired sufficient strength to safely support its own dead weight and any loads that may be imposed thereon; two cylinders of each set will be tested at 7 calendar days and the remaining two at 28 calendar days.

If the results of a seven-day cylinder test indicate that the concrete may not develop the minimum 28-day strength specified, the Project Engineer reserves the right to order the Contractor to immediately core the portion of the concrete structure represented by that cylinder for testing purposes. The coring shall be made of the size and at locations ordered by the Project Engineer. If the results of the core tests indicate that strength is not sufficient to produce a satisfactory strength at 28 calendar days, the portion of the concrete structure represented by the core, as delineated by the Project Engineer, shall be removed, disposed of, and replaced with new construction as directed by the Project Engineer. If the results of the core tests indicate, in the sole opinion of the Project Engineer, that satisfactory 28-day strength may yet be realized, possible rejection of the concrete in question will be deferred until the 28-day cylinders are tested. If a 28-day cylinder breaks at a strength below the required value, the Project Engineer

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reserves the right to immediately reject the concrete represented by the cylinder, ordering such construction removed and replaced within designated limits, or he/she may permit the Contractor to perform additional coring. If additional coring is permitted, the Project Engineer will either accept or reject the concrete represented on the basis of the 28-day core tests and all previous tests. The Project Engineer's decision in these cases shall be final and conclusive. Methods of removal and replacement of the defective concrete shall be of the Contractor's option, subject to the approval of the Project Engineer.

Core holes in concrete work that is accepted by the Project Engineer shall be filled with sand-lightweight concrete of the specified mix design. The perimeter surface of the core hole shall be coated with epoxy bonding compound meeting the requirements of Section 9-26 prior to filling with concrete.

Removal and replacement of deficient concrete, as previously outlined, shall be entirely at the Contractor's expenses.

Placement

Notify the Project Engineer at least 48 hours prior to actual placement for each Class 4000LW Concrete pour.

Acceptance Requirements

Acceptance is based on the requirements of Section 6-02.3(5).

6-02.3(6)H CONCRETE CLASS 4000WT (WATERTIGHT CONCRETE) (NEW SECTION)

Concrete Class 4000WT shall be used for the exterior Bascule Pier walls as noted in the Plans.

The Contractor shall design the concrete mixture and determining the proportions of cement, fine aggregate, coarse aggregate, water and admixtures which will produce a workable low permeability, low shrink, low crack formation concrete mix. Concrete Class 4000WT shall conform to requirements of Section 6-02 and as specified in the following.

The maximum water-cementitious materials ratio shall be 0.36.

The concrete shall exhibit no indications of aggregate or paste segregation.

Slump retention and setting time shall be controlled by using a retarding or hydration-stabilizing mixture.

The concrete shall not be air entrained.

The concrete shall have a minimum compressive strength of 4,000 psi.

Creep and shrinkage shall be less than 350 microstrains.

Aggregates shall have an expansion less than or equal to 0.20 percent, when tested in accordance with AASHTO T303, or an expansion less than or equal to 0.04 percent, when tested in

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accordance with ASTM C1293. Use of aggregates with expansions exceeding these specified amounts, with or without mitigation measures, will not be allowed.

The Contractor shall submit a mix design for the concrete to the Project Engineer for approval in accordance with Section 6-02.3(2)A.

As part of the Contractor's concrete mix design submittal, the Contractor shall submit the results of a permeability test conducted on the proposed mix design in accordance with AASHTO T277. The maximum permeability shall be 1,000 coulombs at 56 calendar days. The permeability test results shall be submitted to the Project Engineer at least 30 calendar days prior to the first scheduled placement of the Concrete Class 4000WT in the caisson. This permeability test is required for approval of mix design only, and will not be a requirement for acceptance of production concrete.

The Contractor shall perform the following tests as part of the Contractor's mix design submittal:

- Compressive strength at 1, 2, 7, 14, 28 and 56 days in accordance with ASTM C39.
- Rapid chloride permeability at 28 and 56 days in accordance with ASTM C1202.
- Creep and shrinkage in accordance with ASTM C512.
- Modulus of elasticity at 3 and 28 days in accordance with ASTM C469.
- Freeze-thaw in accordance with ASTM C666 (300 cycles, durability factor minimum)
- Length change/drying shrinkage in accordance with ASTM C157.
- Ring shrinkage in accordance with ASTM C1581.
- Splitting tensile strength at 28 days in accordance with ASTM C496.
- Large batch in accordance with AASHTO R39.
- Static segregation of SCC by column method in accordance with ASTM C1610.
- Passing ability of SCC by J-ring in accordance with ASTM C1621.

Placement

Notify the Project Engineer at least 48 hours prior to actual placement for each Concrete Class 4000WT pour. At least 48 hours shall separate pour sequences shown in the Contract Plans for Concrete Class 4000WT.

Acceptance Requirements

Acceptance is based on the requirements of Section 6-02.3(5).

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6-02.3(7) CONCRETE EXPOSED TO SEA WATER

The following is added at the end of this section:

Form release agent used for construction of the caissons and piers in the Duwamish Waterway shall be bio-degradable and non-toxic. Submit product information to the Project Engineer.

6-02.3(12) CONSTRUCTION JOINTS

The following is added at the end of this section:

All horizontal construction joints in the bascule pier exterior walls shall be located at rustications.

6-02.3(13)A EXPANSION JOINT SYSTEM (NEW SECTION)

The expansion joint system between the approach spans and the bascule piers shall be of the type and configuration depicted in the Contract Plans. The expansion joint system shall be installed in accordance with the manufacturer's published recommendations. The reference to any proprietary products in the Plans shall be considered an acceptable manufacture, not a Contract requirement.

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

1. Plan, elevation, and sections of the joint system and all components, with dimensions and tolerances.
2. All material designations.
3. Manufacturer's written installation procedure.
4. Corrosion protection system used on the metal components.
5. Locations of welded shear studs, lifting mechanisms, temperature setting devices, and construction adjustment devices.
6. Method of sealing the system to prevent leakage of water through the joint.

The expansion joint system shall be removable and replaceable. Field welding of expansion joint system will not be allowed.

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 Project Engineer, at no additional cost to the County.

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The Expansion Joint System shall conform to the following requirements:

General

The Work shall consist of fabricating, furnishing and installing a bridge deck expansion joint sealing system at Piers 3 and 4 in accordance with the details shown on the Contract Plans and the requirements of the Specifications.

Manufacturer shall have a minimum ten (10) years experience specializing in the design and manufacture of expansion control systems.

Quality Control

Manufacturer shall be ISO-9001:2008, RC14001:2008 certified and shall provide written confirmation that a formal Quality Management System and Quality Processes have been adopted in the areas of, (but not limited to) engineering, manufacturing, quality control and customer service for all processes, products and their components. Alternate manufacturers will be considered provided they submit written proof that they are ISO 9001:2008, RC14001:2008 certified prior to the project bid date.

Product

Provide a watertight joint sealing system that is capable of accommodating the structures movement. The joint sealing system shall consist of elastomeric molded neoprene panels that are reinforced with structural steel angles and imbedded wear plates. The system is cast into the structure by cast in place anchors. The elastomeric panels shall be designed to withstand traffic loads. Provide panel size that satisfies project requirements including movement and water tightness. Install all components utilizing manufacturer's recommended sealants for complete installation.

Component and Materials

The Contractor shall furnish a manufacturer's certification that the materials proposed have been pre-tested and will meet the requirements as set forth in the specification.

1. Elastomeric Molded Panels

   The 6'-0" elastomeric molded panels shall be comprised of a formed steel shape suspended in an elastomeric material. The profile-riding surface shall have imbedded wear plates to ensure skid resistance and shall be capable of accommodating traffic loads. Each elastomeric molded panel shall be supplied with integrated bolt hole cavities and tongue and groove end connections.

   The elastomer used to mold the panels shall be manufactured of a neoprene compound exhibiting the physical properties listed in the table below:

Physical Properties	Test Method	Requirement
Tensile Strength	D-412-98A	1800 (12.4)

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Elongation at break min%	D-412-98A	400%
Hardness, Type Shore A Durometer	D-2240-02	40-50
Compression Set, 22hrs @158F (70C) max. Method B (modified)	D-395-01	20%
Oil Swell, ASTM #3 Oil, 70hrs @ 212F(100C) Volume Change	D-471-98	120%
Ozone Resistance, 20% Strain 100 pphm in air 70hrs.@104F. (40C) (wipe with toluene to remove surface contamination)	D-1149-99	No Cracks
Low Temperature, brittleness (3min@-40F)	D-746-79(1987)	Not Brittle

2. Steel Angle

The steel angles imbedded in the molded neoprene panels are formed from ASTM A-36 steel.

3. Bolt Cavity Sealant

Bolt hole cavities shall be filled using a two part polyurethane sealant that meets Federal Specification TT-S-00227E. Contractors to ensure that the anchor blocks are dry from moisture prior to placement of material.

4. Edge Void Sealant

Edge voids shall be filled with a one part polysulfide base synthetic rubber sealant conforming to Federal Specification TT-S-00230C Type II Non-Sag. Contractor shall ensure that the anchor blocks are dry from moisture prior to placement of material.

5 Bedding Compound

Apply edge void sealant as a bedding material to the blockout base prior to placement of the elastomeric gland. Material shall be a one part polysulfide base synthetic rubber sealant conforming to Federal Specification TT-S-00230C Type II Non-Sag.

Construction Requirements

The Contractor shall submit product information and necessary shop drawings. The Contractor shall furnish to the Project Engineer a representative sample of material to be supplied in accordance with the Contract Documents.

The device shall be accurately set and securely supported at the correct grade and elevation and the correct joint opening as shown on the Plans and on the shop drawings.

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The manufacturer instructions for the proper installation of the joint system shall be entered on the shop drawings. Shop drawings, which lack manufacturer installation instruction, may be returned without approval.

After the joint system is installed, the joint system 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 Project Engineer, at no additional cost to the Contracting Agency.

6-02.3(13)B COMPRESSION SEAL EXPANSION JOINT SYSTEM (NEW SECTION)

Compression Seal Expansion Joint System

The compression seal expansion joint system shall be installed in accordance with the manufacturer's written recommendations. The Contractor shall submit the manufacturer's written installation procedure to the Project Engineer prior to installing the expansion joint system.

After the joint system is installed, the joint area 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 Project Engineer, at no additional cost to the Contracting Agency.

6-02.3(14)C PIGMENTED SEALER

The following is added at the beginning of this section:

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

The color of pigmented sealers to be applied to shall match that described in the Plans.

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

6-02.3(19)A ELASTOMERIC BEARING PAD ASSEMBLIES (NEW SECTION)

Elastomeric bearing pads shall be used in the bearings as shown on the Plans at Piers 3 and 4. Elastomeric bearing pads shall conform to Section 9-31, except as shown on the Plans.

Description

Elastomeric bearing pads are used in the bearings at Pier 3 and 4 for the North and South Approach Span Bridges. The bearings at both Pier 3 and 4 are expansion. This Work includes

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all materials for the construction and installation of the bearings as shown in the Plans and as specified.

The expansion bearing consists of an upper unit and a lower unit. The upper unit includes an upper sole plate, a lower sole plate, or a top plate, and a stainless steel sheet. The lower unit includes a polytetrafluorethylene (PTFE) sheet, a steel backing plate, an elastomeric pad, or with a stop bar assembly, a masonry plate, and transverse restrainers. The upper and lower units shall be supplied by a single bearing manufacturer.

Materials

1. The elastomeric bearing pads shall conform to Section 9-31, except as shown on the Plans.

   The elastomeric bearing pads shall meet all Level I and Level II acceptance criteria as specified in AASHTO M 251. The Contractor shall perform a Long Duration Compression Load test on the elastomeric bearing pads randomly selected from each size and material batch of the production bearings. The Contractor shall test one bearing per lot, minimum, where one lot is defined as ten percent of the total number of production bearings in each size and material batch. The Long Duration Compression Load test shall be as specified in Sections 18.7.2.6 and 18.7.4.5.7, Division II Construction, of the AASHTO Standard Specifications for Highway Bridges, Sixteenth Edition and latest interims. The Contractor shall submit the test results to the Project Engineer for approval.

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

2. The PTFE self-lubricating bearing sheet shall be 1/8 inch thick unless otherwise noted in the Plans. The PTFE sheet shall be composed of 100 percent virgin (unfilled) polytetrafluorethylene polymer except where filled PPTFE is called for in the Plans. The PTFE sheet shall be recessed and bonded to a depth of one half the PTFE sheet thickness into the steel backing plate. The exposed height of the PTFE shall be not less than 3/64 inch. The substrate shall limit the flow (elongation) of the confined PTFE to not more than .009 inch under a load of 2,000 psi for 15 minutes at 78 degrees F for a 2-inch x 3-inch test sample. Dimpled PTFE, if shown in the Plans, shall be unfilled and have a minimum thickness of 3/16 inch. Dimples shall be placed in a 1/2 inch grid and shall have a depth of 1/16 inch. The properties of the (unfilled) PTFE shall be certified to conform to the following requirements:

Requirement	Test Method	Value
Hardness at 78°F	ASTM D 2240	50-65 Durometer D
Tensile Strength, psi	ASTM D 1457	2800 (Min. Avg.)

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Elongation %	ASTM D 1457	200 (Min. Avg.)
Specific Gravity	ASTM D 792	2.14 to 2.21

3. The filled PTFE sheet shall be made from virgin PTFE resin uniformly blended with inert filler material (15% glass fiber). The properties of (filled) PTFE shall be certified to conform to the following requirements:

Requirement	Test Method	Value
Tensile Strength	ASTM D 1457	2200 psi (Min. Avg.)
Elongation %	ASTM D 1457	150% (Min. Avg.)
Specific Gravity	ASTM D 792	2.2
Melting Point	ASTM D 1457	327C±10C

4. The stainless steel sheet shall be no less than 14 gage meeting ASTM A 240 Type 304 specifications. Stainless steel in contact with the PTFE shall have a finish of 10 microinches R.M.S. (Root-Mean-Square) or less. The stainless steel sheet shall be seal welded all around to the sole plates by the gas tungsten-arc welding process (GTAW) in accordance with applicable AWS recommended practices. The seal weld shall not protrude beyond the surface of the stainless steel. The stainless steel sheet shall be clamped down to have full contact with the sole plate during welding. The surface of the sole plate in contact with the stainless steel sheet shall have a surface roughness of 125 microinches R.M.S.

5. The sole plate, top plate, steel backing plate, bars and masonry plate shall conform to AASHTO M 270 Gr.50, or ASTM A 572 Gr. 50 and the dimensions shall comply with the details as shown in the Plans. The surface of the recess of the steel backing plate shall have a surface roughness of 250 microinches R.M.S. All exposed steel plate surfaces, except stainless steel surfaces, shall be painted in accordance with the Special Provision APPLICATION OF PAINT. The stainless steel sheet to sole plate seal weld shall be painted in accordance with the Special Provision APPLICATION OF PAINT. AASHTO M314 F1554 bolts, ASTM A 449 bolts, nuts, and washers shall be hot-dip galvanized in accordance with AASHTO M 232.

6. The epoxy gel for setting sole plates on precast or steel girders shall conform to the requirements of Section 9-26.1, Type 1, Grade 3, Class A, B, or C. The silicone grease to be used in preventing bond between the epoxy gel and the sole plate shall conform to military specification MIL-S-8660. The Contractor shall submit certification from the manufacturer that certifies the silicone grease and epoxy meets these specifications.

7. The welded shear studs attached to the sole plates embedded in the modified precast girders shall conform to the requirements of Section 9-06.15.

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Construction Requirements

1. Before fabrication of any bearing, the Contractor shall submit shop drawings to the Project Engineer for approval in accordance with Section 6-03.3(7). These drawings shall include but not be limited to the following information:

   a. Plan and elevation of the bearing showing dimensions and tolerances.

   b. Complete details of all components and sections showing all materials incorporated into the bearing.

   c. All AASHTO, ASTM or other material designations.

   d. Bearing manufacturer's recommendations and procedures for bearing assembly shipment and storage.

2. Prior to the installation of the fabric pad bearings in part or in whole, the Contractor shall submit to the Project Engineer the following test reports, certifications, and samples for review, testing and approval.

   a. Manufacturer's certificate of compliance for the polytetrafluorethylene (PTFE) sheeting, fabric, and elastomer.

   b. Certified mill test reports for all steel and stainless steel in the bearing assemblies.

   c. Certified test reports confirming that the elastomeric pads meet the specified requirements of Section 9-31.

   The time to test and review the submitted items will be a minimum of 15 calendar days from the time these items are received at the Project Engineer's office until the necessary information is returned to the Contractor at the project site. The actual time required for review is dependent upon the completeness and accuracy of the material as submitted. Any deficiencies will require additional time for review. If submittals are returned to the Contractor to correct deficiencies, an additional 15 calendar days may be required for the review process.

   Field inspection of a representative number of bearings assemblies will be performed by the Project Engineer. A clean dry and enclosed area shall be provided by the Contractor. The Project Engineer will identify the bearing assemblies to be inspected and the Contractor shall do all the necessary Work to allow the Project Engineer to inspect the bearing assemblies.

3. Flatness of bearing surfaces shall be determined by the following method:

   a. A precision straightedge, longer than the nominal dimension to be measured shall be placed in contact with the surface to be measured as parallel to it as possible.

   b. Select a feeler gauge having an accuracy of ± .001 inch equal to the tolerance allowed and attempt to insert it under the straightedge.

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c. Surfaces are acceptable if the feeler gauge does not pass under the straightedge.

d. In determining the flatness, the straightedge may be located in any position on the surface being measured.

4. Flatness tolerances shall be defined as follows:

Class A tolerance = 0.0005 x nominal dimension

Class B tolerance = 0.001 x nominal dimension

Class C tolerance = 0.01 x nominal dimension

(Nominal dimension shall be taken as the actual dimension of the plate or sheet under the straightedge, in inches.)

5. Manufacturing tolerances for the bearings are as follows:

a. PTFE Sheet

Plan dimensions:	Total nominal design area -0, +1/8"
Thickness:	-0", + 1/64"
Flatness:	Class B tolerance, both surfaces

b. Stainless Steel Sheet

Plan dimensions:	-0", +3/16"
Flatness:	Class B tolerance, both surfaces

c. Sole Plate and Top Plate

Plan dimensions:	-0", +3/16"
Thickness:	-1/16", +3/16"
Flatness:	Class B tolerance, side in contact with the Stainless Steel, Sole Plate, or Top Plate Class C tolerance, side in contact with epoxy gel, grout, or concrete

d. Steel Backing Plate

Plan dimensions:	-0", +3/16"
Thickness:	-0", +3/16"

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Width and length of recess:	-0", +1/16", of PTFE sheet size
Flatness:	Class B tolerance, both surfaces

e. Elastomeric Pad Section 9-31 requirements

f. Masonry Plate & Bars

Plan dimension:	-0", +3/16"
Thickness:	-0", +3/16"
Flatness:	Class B Tolerance, side in contact with masonry plate or bars. Class C tolerance, free side or side in contact with grout.

g. Overall Height

Total thickness:	-0, +10 percent

6. The Contractor shall protect the bearing assemblies from all damage, and exposure to the elements, during shipment and storage prior to installation in accordance with the manufacturer's recommendations and procedures listed in the shop drawings as approved by the Project Engineer.

7. The sliding surfaces shall be finished true, lubricated and installed level or installed as shown in the Plans for transverse restrainer bearings.

8. A uniform thin film of silicone grease shall be applied to the entire PTFE sheet before installation.

9. For cast-in-place concrete superstructures the sole plates shall be anchored to the structure as shown in the Plans.

10. For precast concrete superstructures and steel superstructures the sole plates shall be set with epoxy gel just before setting the superstructure in place. The sole plate top surface in contact with the epoxy gel shall receive a thin uniform film of silicone grease, to prevent bonding to the epoxy gel. The anchor bolts and insert threads shall be greased to prevent bonding and allow future removal. Apply epoxy gel by troweling it into the concrete recess or onto the bottom of the steel superstructure and immediately bolting the sole plate in place to obtain a level surface. Before the epoxy gel has cured, the superstructure shall be set in place, squeezing out excess epoxy gel while filling the entire recess. Excess epoxy and grease shall be removed immediately. Special care shall be exercised at all times to ensure protection of the stainless steel and PTFE surfaces from coming in contact with concrete or any other foreign matter. After the epoxy gel has cured, the anchor bolts shall be tightened to snug tight.

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11. The lower contact surface of the PTFE sheet shall be bonded to the steel backing plate with epoxy specified by the PTFE manufacturer. The grout pad and masonry plate shall be installed level. The grout pad shall be pressure installed starting at the middle of the masonry plate.

12. All forms and debris that tend to interfere with the free action of the bearing assemblies shall be removed at the time falsework and forms are removed.

6-02.3(19)C HIGH LOAD ELASTOMERIC BEARING PADS (NEW SECTION)

High-Load Elastomeric bearing pads are used in the bearings at Abut 1 and 6 for the North and South Approach Span Bridges. The bearings at both abutments are expansion. This Work includes all materials for the construction and installation of the bearings as shown in the Plans and as specified.

High-Load Elastomeric bearing pads shall conform to Section 9-31, except as shown on the Plans.

Materials

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

The Contractor shall perform a Long Duration Compression Load test on high-load elastomeric bearing pads randomly selected from each size and material batch of the production bearings. The Contractor shall test one bearing per lot, minimum, where one lot is defined as ten percent of the total number of production bearings in each size and material batch. The Long Duration Compression Load test shall be as specified in Sections 18.2.5.6 and 18.2.5.7 of the AASHTO LRFD Bridge Construction Specifications, current edition and latest interims. The Contractor shall submit the test results to the Project Engineer for approval.

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

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

Silicone grease shall conform to US Navy QPL AS8660-2.

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

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

Construction Requirements

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

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

The Contractor shall set the sole plate with epoxy gel just before setting the superstructure in place on the bearing. The Contractor shall spread a thin uniform film of silicone grease on the top surface of the sole plate in contact with the epoxy gel to prevent bonding of the sole plate to the epoxy gel. The Contractor shall grease the bolts attaching the sole plate to the superstructure to prevent bonding and allow for future removal. The Contractor shall apply epoxy gel to the bottom surface of the superstructure and immediately bolt the sole plate in place to obtain a level surface at the bottom of the sole plate. The Contractor shall set the superstructure in place on the bearing before the epoxy gel has cured, squeezing out excess epoxy gel. The Contractor shall immediately remove all excess epoxy gel and grease. After the epoxy gel has cured, the Contractor shall tighten the sole plate attachment bolts.

6-02.3(24) REINFORCEMENT

This section is deleted in its entirety and replaced with the following:

The Contractor shall prepare and submit a schedule of reinforcement bars (bar list) and associated bar bend diagrams for each concrete component of the bridge. The schedules of reinforcement bars shall incorporate the bar marks shown in the Contract Plans such that there is a one-to-one correlation between the Contract Plans and Contractor provided schedules of reinforcement bars.

The schedules of reinforcement bars shall be in WSDOT standard format and include the following information for each reinforcement bar:

- Bar mark number
- Location in the bridge
- Contract Plan sheet number depicting the bar
- Bar size
- Number of bars required
- Bar bend type and associated bend diagrams
- Indication if the bar is a tie or stirrup
- Indication if the bar is in the substructure quantities
- Indication if the bar is to be epoxy coated
- Indication if the bar dimensions vary between dimensions shown on two lines
- Bar bend dimensions in feet and inches

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Bar bend angles of bends in degrees

Total length of bar in feet and inches

Total weight of bar in pounds

Before ordering material, submit all schedules of reinforcement bars according to Section 1-05.3(1) to 1-05.3 for approval. Do not order material until the schedules of reinforcement bars have been approved. The review of order lists and bending diagrams by the Project Engineer shall in no way relieve the Contractor of responsibility for the correctness of such schedules of reinforcement bars. Revise schedules as required to make them comply with the design drawings at no additional cost to the County.

Various steel reinforcing bars, including those in crossbeams, may be shown as straight in the bar lists. The Contractor shall bend these bars as required to conform to the configuration of the Structure and as detailed in the Plans.

Schedules of reinforcement bars will not be required to be sealed by a Professional Engineers licensed in the state of Washington.

Provide the Project Engineer with 5 copies of the final approved schedules of reinforcement bars, unbound, collated and paginated on 11 x 17 sheets.

6-02.3(25)B CASTING

The second paragraph in this section is deleted and replaced with the following:

The Contractor shall fabricate all prestressed concrete girders using the Contractor-Provided mix design appropriate for the design strength specified for each girder in accordance with Sections 6-02.3(2)A and 9-19.1 as supplemented in these Special Provisions, and as approved by the Project Engineer. The temperature of the concrete when placed shall be between 50F and 90F.

6-02.3(25)E CONTRACTORS CONTROL STRENGTH

The following is added at the end of this section:

For the prestressed girders of "Superstructure - _____ Approach Span" the Contractor may substitute compressive strength testing at 28 days provided that the 28 day compressive strength is equal to or greater than 95 percent of the required 56 day compressive strength.

6-02.3(25)M SHIPPING

The first paragraph in this section is deleted and replaced with the following:

After the girder has reached its 28-day design strength, or 95 percent of the 56 day design strength for the girders of "Superstructure - _____ Approach Span", and the fabricator believes it to comply with the specification, the girder and a completed Certification of Compliance, signed by a Precast/Prestressed Concrete Institute Technician or a Professional Engineer, acceptable to the Contracting Agency, shall be submitted to the Project Engineer for inspection. If the Project

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Engineer finds the certification and the girder to be acceptable, the Project Engineer will stamp the girder "Approved for Shipment".

The third paragraph is deleted and replaced with the following:

The Contractor is advised that, because of the higher compressive design strengths required for the production prestressed concrete girders of "Superstructure - _____ Approach Span", it will take longer than the usual time for these girders to reach sufficient strength for shipping. The Contractor shall take this into account when preparing schedules for this portion of the Work.

6-02.3(29) EPOXY CRACK SEALING (NEW SECTION)

The materials being used may be dermatetic. The Contractor's contact with and use of the materials shall conform to the requirements specified in the MSDS for each material, and all personnel shall be provided with appropriate clothing and protective garments.

All materials shall be stored and protected from ignition sources as recommended by the material manufacturer.

The cracks shall be cleaned of efflorescence, deteriorated concrete and other surface debris, by vacuuming, flushing, routing, sawing or other means as required.

Entry ports shall consist of tubes, tees or other valve devices as recommended by the resin manufacturer. The ports shall be placed at intervals along each crack in accordance with the manufacturer's written instructions for the resin being used. The holes for the entry ports shall be drilled with a hollow bit with an attached vacuum chuck to prevent concrete dust from becoming embedded in the crack.

The exposed crack surfaces and the areas around the entry ports shall be sealed with epoxy sealing paste and cured in accordance with the resin manufacturer's written instructions, to attain a seal capable of withstanding the applied injection pressures.

The Contractor shall furnish the services of a factory trained technical representative to perform the epoxy crack sealing injection.

Injection shall be accomplished with a pressure or injection machine compatible with the resin selected for use and shall begin at the lowest port and continue until there is evidence of the resin at the entry port directly above and adjacent to the port being pumped. When material travel is indicated, the nozzle shall be moved to the port that shows resin. The previously pumped port shall be sealed. Injection shall continue until the crack is completely filled. On wide cracks where resin travel between ports will be rapid, two or more ports may be pumped simultaneously. On exceptionally large cracks, a formulation (dependent upon crack width, ambient temperature, modulus requirements and other variables) of epoxy resin and fine sands shall be used as approved by the Project Engineer.

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After all ports have been pumped and the crack is full, the epoxy resin shall be cured without disturbance in accordance with the resin manufacturer's written instructions as necessary to ensure development of the full bond capacity of the material.

After the epoxy has cured completely, the epoxy sealing paste and port stems shall be ground flush with the original surface of the concrete.

Cores shall be taken after the repair is completed to confirm penetration and bonding. These cores shall be submitted to the Project Engineer for testing in the WSDOT Materials Laboratory.

6-02.3(30) SUPERSTRUCTURE APPROACH SPANS (NEW SECTION)

Contractor shall construct all elements of the bridge approach spans as specified in Section 6-02, unless otherwise shown on the Plans or specified in Section 6-02.3(29). The Work includes but is not limited to the following:

Prestressed Concrete Girders

Girders shall be WSDOT standard prestressed concrete wide flange I girders, type WF74G, with concrete strengths as specified in the Plans. Girders shall be fabricated, shipped, and erected in accordance with Section 6-02.3(25) and as shown in the Plans.

Roadway Deck Slab

Roadway deck slab shall be cast-in-place and shall be constructed of epoxy-coated steel reinforcing bars and class 4000D concrete in accordance with Section 6-02.3(10) and as shown in the Plans.

Sidewalks

Sidewalks shall be cast-in-place and shall be constructed of epoxy-coated steel reinforcing bars and class 4000 concrete and as shown in the Plans.

Pedestrian Railing Curbs

Pedestrian railing curbs shall be cast-in-place and shall be constructed of epoxy-coated steel reinforcing bars and class 4000 concrete and as shown in the Plans. The Work shall include furnishing and installing the pedestrian railing anchorages and curb cuts for the pedestrian rails as shown in the Plans.

Intermediate and End Diaphragms

Diaphragms shall be cast-in-place and shall be constructed of steel reinforcing bars and class 4000 concrete and as shown in the Plans. Blockouts shall be provided in the diaphragms where required to accommodate placement of utilities.

Traffic Gate Platforms

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Traffic gate platforms shall be cast-in-place and shall be constructed of epoxy-coated steel reinforcing bars, steel shear studs, and class 4000 concrete and as shown in the Plans.

Traffic Gate Diaphragms

The traffic gate diaphragms shall be provided at the traffic gate platform locations. The traffic gate diaphragm is similar to the intermediate diaphragms along the bridge, except that the end portion of the traffic gate diaphragm is extended beyond the exterior girder and is attached to a steel bracket using steel anchor bolts. The traffic gate diaphragm shall be cast-in-place and shall be constructed of steel reinforcing bars and class 4000 concrete and as shown in the Plans. The steel bracket and connection materials shall be constructed of structural carbon steel and as shown in the Plans.

Traffic Signal Pole Mountings

Traffic signal pole mountings shall be cast-in-place and shall be constructed of steel reinforcing bars and class 4000 concrete and as shown in the Plans. Anchor plates, anchor rods, and other connection materials shall be constructed of structural carbon steel and shall be placed as shown in the Plans.

Steel Fascia Trusses

Steel fascia trusses shall be provided along the outside edges of the superstructure along span 2 of the south approach and span 4 of the north approach as shown in the Plans. The fascia trusses, connection materials, bracings, and stiffeners shall all be constructed of structural carbon steel in accordance with the requirements of Section 6-03 and as shown in the Plans. Paint the steel fascia trusses in accordance with Section 6-07 and Section 9-08.

Compression Joint Seals

Compression joint seals shall be provided at abutments 1 and 6 and shall be installed in accordance with Section 6-02.3(13) and the manufacturer's written recommendations and as shown in the Plans.

Transflex Expansion Joints

Expansion joints shall be Wabo Transflex Model 650 and shall be provided at piers 3 and 4. Expansion joints shall be installed in accordance with Section 6-02.3(13) and the manufacturer's written recommendations and as shown in the Plans.

Approach Slabs

Approach slabs shall be cast-in-place and shall be constructed of epoxy-coated steel reinforcing bars, steel anchor rods, and class 4000A concrete in accordance with Section 6-02.3(10) and as shown in the Plans.

Bridge Bearing

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High-load elastomeric bearing pads shall be provided at abutments 1 and 6 and shall be installed in accordance with Section 6-02.3(19)A2 and as shown in the Plans.

Elastomeric bearing pads shall be provided at piers 3 and 4 and shall be installed in accordance with Section 6-02.3(19)A1 and as shown in the Plans.

Grout Pads

Grout pads shall be provided at all bearing locations and shall be constructed in accordance with Section 6-02.3(19)B and as shown in the Plans.

Utility Supports

Utility supports including concrete inserts, hanger rods, pipe rollers, lateral bracings, clamps, and hardware shall be constructed in accordance with Section 6-02.3.

Embedded Electrical Conduits

Embedded electrical conduits shall be constructed as shown on the Plans and as specified in Section 8-20.3(5).

Drainage Scuppers

Drainage scuppers shall be constructed as shown in Plans.

Girder Stops

Girder stops shall be constructed as shown in Plans.

Stainless Steel Bearing Pins and Gear Mounting Embedded Anchor Rods

Stainless steel bearing pins, and gear mounting embedded stainless steel anchor rods and hardware shall be installed as depicted on sheets PR20 and PR21 of the Contract Plans.

Pipe insulation on bridge

Pipe insulation on bridge shall be in accordance with Section 9-30.8. Pipe insulation shall be installed along the full length of pipe and around utility supports.

The Work of the bridge approach spans excludes the concrete, reinforcement and miscellaneous metals of the Traffic Barriers depicted on TR sheets of the Contract Plans.

The Work excludes the pedestrian railings depicted on the PR sheets of the Contract Plans except the embedded connection hardware identified above.

The Work excludes the reinforcement bars embedded in the abutments and piers extending into the crossbeams (diaphragms).

6-02.4 MEASUREMENT

The following is added at the end of this section:

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"Expansion Joint System" will not be measured as an individual pay item, but will be included in the lump sum item "Superstructure - ____Approach Span."

"Epoxy Crack Sealing" will be measured per linear foot.

Elastomeric Bearing Pad – Superstr" will not be measured as an individual pay item, but will be included in the lump sum item "Superstructure - ____Approach Span."

"Expansion Joint Compression Seal", will not be measured as an individual pay item, but will be included in the lump sum item "Superstructure - ____Approach Span." Estimated length per L.F. shown as part of the sum item is measured per linear foot along its completed line and slope.

High-load elastomeric bearing pads will not be measured as an individual pay item, but will be included in the lump sum item "Superstructure - ____Approach Span."

Prestressed concrete girders will not be measured as an individual pay item, but will be included in the lump sum item "Superstructure - ____Approach Span."

The lump sum Contract price for "Superstructure - North Approach Span" Contains the following approximate quantities of materials and Work:

Unit	Approx. Quant.	Unit
Epoxy-Coated St. Reinf. Bar.	166,845	LB
St. Reinf. Bar – Superstr.	17,100	LB
Concrete Class 4000D For Bridge	663	CY
Concrete Class 4000 For Superstr.	215	CY
Prestressed Conc. Girder WF74G.	2,741	L.F.
High-load Elastomeric Bearing Pads.	11	EA
Elastomeric Bearing Pad	9	EA
Structural Carbon Steel – Superstr.	50,862	LB
Expansion Joint System Compression Seal	10	L.F.
Expansion Joint System	71	L.F.
Pipe Hanger For two 8" Diam. SD Lines	70	EA
Pipe Hanger For 8" Diam. Fire Protection Line and 1 ¼-inch insulated water line	54	EA
Pipe Hanger For 6" Diam. Sewer Line	37	EA

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Pipe Hanger For 4-4”, 1-2”, and 1-1” Diam. Conduit Cluster	54	EA
Concrete Inserts	430	EA
18” Diam. Steel Pipe Casing	2	EA
16” Diam. Steel Pipe Sleeve	2	EA

The lump sum Contract price for “Superstructure - South Approach Span” Contains the following approximate quantities of materials and Work:

Unit	Approx. Quant.	Unit
Epoxy-Coated St. Reinf. Bar.	164,975	LB
St. Reinf. Bar – Superstr.	17,084	LB
Concrete Class 4000D For Bridge	659	CY
Concrete Class 4000 For Superstr.	214	CY
Prestressed Conc. Girder WF74G.	2,723	L.F.
High Load Elastomeric Bearing Pad.	11	EA
Elastomeric Bearing Pad	9	EA
Structural Carbon Steel – Superstr.	50,862	LB
Expansion Joint System Compression Seal	10	L.F.
Expansion Joint System	71	L.F.
Pipe Hanger For two 8” Diam. SD Lines	70	EA
Pipe Hanger For 8” Diam. Fire Protection Line and 1 ¼-inch insulated water line	54	EA
Pipe Hanger For 6” Diam. Sewer Line	37	EA
Pipe Hanger For 2-4” Diam. and 1-2” Diam. Conduit Cluster	54	EA
Concrete Inserts	430	EA
18” Diam. Steel Pipe Casing	2	EA
16” Diam. Steel Pipe Sleeve	2	EA

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

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in the lump sum Contract price for "Superstructure - South Approach Span" or “Superstructure – North Approach Span” even though the actual quantities required may deviate from those listed.

6-02.5 PAYMENT

The following is added at the end of this section:

“Epoxy Crack Sealing”, per linear foot.

"Superstructure - _____ Approach Span", lump sum.

The lump sum Contract price for “Superstructure - South Approach Span” and “Superstructure – North Approach Span” shall be full pay for performing the Work as specified and depicted in the Contract Plans including shop drawing submittals, fabrication, testing, storage, handling, shipping, erection, painting of steel fascia trusses, furnishing and removing oak block wedges from prestressed concrete girders, furnishing and removing temporary bracing and/or falsework, finishing and all costs associated providing the bridge approach spans in their entirety as deemed acceptable by the Project Engineer including the prestressed concrete girders (WF74G), high-load elastomeric bearing pads, traffic gate support diaphragms, traffic signal pole blisters, structural bridge deck, sidewalks, pedestrian railing curbs, traffic gate platforms, intermediate and end crossbeams (diaphragms), steel fascia trusses on approach spans 2 and 4 and associated connection devices / hardware / studs / concrete inserts / epoxy grout / elastomeric pads, expansion joint compression seals at the abutments 1 and 6, expansion joint system (WABO TRANSFLEX) at the bascule piers 3 and 4, utility supports including inserts / hangers / rollers / lateral bracings / clamps / hardware, utility penetrations, pipe insulation, embedded electrical conduits, drainage scuppers, grout pads, girder stops, and stainless steel bearing pins, and gear mounting embedded stainless steel anchor rods and hardware depicted on sheets PR20 and PR21 of the Contract Plans.

The lump sum Contract price for “Superstructure - ____ Approach Span” shall include all Work associated with the prestressed concrete girders as specified, including shop drawing submittals, fabrication, storage, handling, shipping, erection (including all site preparation and restoration activities necessary for erection equipment access and support), furnishing and removing oak block wedges, furnishing and removing temporary bracing, and furnishing and cutting temporary strands. For deck bulb tee girders and PCPS members, all Work related to equalizing girder camber, connecting weld-ties, and grouting keyways, shall also be included. For spliced prestressed concrete girders, all Work related to cast-in-place concrete closures and post-tensioning shall be included.

The lump sum Contract price for “Superstructure - ____ Approach Span” shall include all Work associated with the High-Load Elastomeric Bearing Pad, including furnishing, testing, and installing the bearing assemblies as specified, including all Work required to adjust the bearing assemblies to their correct position following installation.

All costs in connection with placing Bridge Supported Utilities through the "Superstructure - South Approach Span” and “Superstructure – North Approach Span” as shown in the Plans, shall be included in the , lump sum cost for Superstructure - _____ Approach Span. Costs for

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furnishing, and installing concrete inserts, conduits, hangers, penetrations, and block outs for Fiber Optic Conduit fiberglass electrical conduit shall not be included in the lump sum Contract price for “Superstructure - ____ Approach Span".

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

“St. Reinf. Bar for Bridge”, per pound.

Payment for reinforcing steel shall include the cost of furnishing, fabricating, and placing the reinforcement. In Structures of reinforced concrete where there are no structural steel Bid items, such minor metal parts as expansion joints, bearing assemblies, and bolts will be paid for at the unit Contract price for “Reinforcing Bar for Bridge” unless otherwise specified.

6-03 STEEL STRUCTURES

6-03.3(7) SHOP PLANS

This section is deleted in its entirety and replaced with the following:

The Contractor shall submit for approval, one set of reproducible shop drawings and associated executable computer aided drafting (CAD) files required for fabricating the steel to the Project Engineer. The Contractor may designate in writing to the Project Engineer that shop drawings will be submitted directly from the fabricator.

If any sheets require correction, the Contractor shall correct and resubmit them in reproducible form as required above. No material shall be fabricated until: (1) the Project Engineer has approved the plans, and (2) the Engineering Services Materials Lab has approved the materials source and the fabricator.

In approving shop plans, the County accepts only the nature and scope of the details without validating any dimensions.

Unless the Project Engineer permits it in writing, no changes shall be made in any drawing after its approval.

Before physical completion of the project, the Contractor shall furnish the Project Engineer set of reproducible copies of the as-built shop plans and CAD files. The CAD files shall be in AutoCAD 2008 format. The reproducible copies shall be clear, suitable for microfilming, and on permanent sheets that measure no smaller than 11 by 17 inches. Additionally, the shop drawings shall be provided in an Engineer approved electronic CAD format with the approval of the Project Engineer.

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6-06 BRIDGE RAILINGS

6-06.1 DESCRIPTION

The following is added at the end of this section:

Section also includes providing and building metal traffic barriers upon which metal railing may be installed.

6-06.2 MATERIALS

The following is added to the list in this section:

Metal Traffic Barriers	9-06.19

6-06.3(3) METAL TRAFFIC BARRIER – BASCULE SPAN (NEW SECTION)

Metal traffic barrier includes that portion of the traffic barrier fabricated of metal and mounted on the bascule span of the bridge. Metal traffic barriers shall be made of steel in accordance with Section 9-06.19.

Before fabricating the traffic barriers, the Contractor shall submit 6 copies of the shop plans for the Project Engineer's approval. The Contractor may substitute other rail connection details for those shown in the Plans if details of these changes show in the shop plans and if the Project Engineer approves. In approving shop plans, the Project Engineer indicates only that they are adequate and complete enough. Approval does not indicate a check on dimensions.

Traffic barriers shall be installed true to line and grade (or camber). The Contractor shall readjust all or part of the traffic barriers, if necessary, to create an overall line and grade pleasing to the eye.

6-06.4 MEASUREMENT

The following is added at the end of this section:

Traffic Barrier - Bascule will be measured by the linear foot along the completed line and slope of the barrier at the curb line.

6-06.5 PAYMENT

The following is added at the end of this section:

"Traffic Barrier - Bascule", per linear foot.

The unit Contract price per linear foot for "Traffic Barrier - Bascule" shall be full pay for fabricating , placing, adjusting, and finishing metal traffic barrier and furnishing and installing steel railing thereon.

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6-10 CONCRETE BARRIER

6-10.1 DESCRIPTION

The following is added at the end of this section:

Traffic barrier shall be Traffic Barrier – SEW and Traffic Barrier - Approach types as shown in the Plans.

6-10.3(2) CAST-IN-PLACE CONCRETE BARRIER WITH METAL RAILING

The following is added at the end of this section:

Steel railing attached to concrete barrier shall be in accordance with Section 6-06.3(2) and the Plans.

6-10.4 MEASUREMENT

The following is added at the end of this section:

Traffic Barrier – SEW will be measured by linear foot along the line and slope at the top of the completed wall.

Traffic Barrier – Approach will be measured by linear foot along the line and slope at the top of the completed wall.

6-10.5 PAYMENT

The following is added at the end of this section:

"Traffic Barrier – SEW", per linear foot.

The unit Contract price per linear foot for "Traffic Barrier - SEW" shall be full pay for constructing the barrier on top of the moment slab in the roadways as shown in the Plans and shall be full pay for furnishing and installing metal railing along the top of the traffic barrier; and shall be full pay for constructing the moment slab.

"Traffic Barrier – Approach", per linear foot.

The unit Contract price per linear foot for "Traffic Barrier – Approach" shall be full pay for constructing the barrier on top of the bridge deck, and associated bridge approach slabs, excluding the steel reinforcing bars that extend from the bridge deck and bridge approach slab; and shall be full pay for furnishing and installing steel railing along the top of the traffic barrier.

6-11 REINFORCED CONCRETE WALLS

6-11.3(6) TRAFFIC BARRIER AND PEDESTRIAN BARRIER

This section is deleted in its entirety and replaced with the following:

When shown in the Plans, traffic barrier and pedestrian barrier shall be constructed in accordance with Sections 6-02.3(11)A and 6-10.3(2), and the details shown in the Plans.

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When shown in the Plans, wall coping for pedestrian railing shall be constructed in accordance with Sections 6-02.3(11)A , 6-10.3(2) and the details shown in the Plans.

6-11.4 MEASUREMENT

The following is added at the end of this section:

Wall coping for pedestrian railing will be measured by the linear foot along the line and slope at the top of the completed wall.

6-11.5 PAYMENT

The following is added at the end of this section:

"Wall Coping for Pedestrian Railing", per linear foot.

The unit Contract price per linear foot for "Wall Coping for Pedestrian Railing" shall be full pay for constructing the coping on top of the SEW and CIP walls, including anchor bolt embedments as shown in the Plans.

6-13 STRUCTURAL EARTH WALLS

6-13.1 DESCRIPTION

The following is added at the end of this section:

Structural Earth Wall shall be two-stage construction as shown on the Plans.

The Contractor shall design, provide, install and remove temporary shoring as necessary to accommodate construction and traffic staging as shown in the Contract Plans.

This Work shall consist of furnishing all materials, labor, tools, equipment, temporary shoring, services and incidentals necessary to construct the SEW in accordance with the Plans, the Standard Specifications, and the Special Provisions.

6-13.1(1) TWO-STAGE CONSTRUCTION FOR SEW (NEW SECTION)

The walls shall be constructed in two stages as follows:

A. The first stage wall shall consist of the construction of wire face support walls and retained embankment backfill. Initial settlement period shall be as defined in Section 6-13.3(1)B and shall begin upon completion of the first stage wall.

B. The second stage wall shall consist of the construction and installation of leveling pads, concrete facing panels, and free draining backfill between the wire facings and the concrete facing panels.

C. Construction of the second stage walls, cast-in-place copings, sidewalks, pedestrian handrails, and drainage and utilities within the zone of influence of the structural earth walls

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shall be deferred until after the initial settlement period, but not prior to completion of all abutments of the approach spans, which could cause wall deformation or damage the completed facing.

D. Copings, sidewalks, and traffic barriers shall not be constructed or installed until after such time as, in the opinion of the Project Engineer, settlements due to the embankments of the structural earth walls are not likely to occur.

E. The second stage and the first stage walls shall be one single integrated wall system.

6-13.2(1) WELDED WIRE FACED STRUCTURAL EARTH WALL MATERIALS (NEW SECTION)

A. Welded Wire Mats and Backing Mats

Welded wire fabric for welded wire mats, welded wire form facing units, and backing mats shall conform to AASHTO M 32, and shall be fabricated from smooth wire fabric conforming to AASHTO M 55.

The minimum clear opening dimension of the backing mat, or the combination of welded wire form facing unit with geosynthetic wall facing wrap, shall not exceed the minimum particle size of the wall facing backfill as specified below in Section 6-13.2(1)B.

Welded wire fabric for welded wire mats, welded wire form facing units, and backing mats shall be galvanized after fabrication in accordance with either ASTM A 641 (two ounces minimum per square foot) or AASHTO M 111. All damage to the galvanizing shall be repaired with one coat of Formula A-9-73 paint conforming to Section 9-08.2.

B. Backfill for Welded Wire Faced Structural Earth Wall

All backfill material within the structural earth wall reinforced zone shall be free draining, free from organic or otherwise deleterious material.

Backfill material within the reinforced zone, except for the wall facing backfill placed immediately behind the wall face, as shown in the Plans and the structural earth wall working drawings as approved by the Project Engineer, shall conform to Section 9-03.14(1) or to Section 9003.14(4) for geosynthetic-reinforced walls. Retained backfill, not within the reinforced zone for the Structural Earth Wall, shall conform to Section 9-03.14(1).

The coarse, granular material used for the wall facing backfill placed immediately behind the wall face, as shown in the Plans, shall conform to the following gradation requirements:

1. The minimum particle size shall be no less than the width of the minimum opening dimension in the backing mat or the geosynthetic wall facing wrap.

2. The maximum particle size shall be no greater than six inches for welded wire reinforced walls, and no greater than four inches for geosynthetic reinforced walls.

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All material within the structural earth wall reinforced zone shall be substantially free of shale or other soft, poor durability particles, and shall not contain recycled materials, such as glass, shredded tires, Portland cement concrete rubble, or asphaltic concrete rubble. The material shall meet the following aggregate durability requirements:

Property	Test Method	Allowable Test Value
Los Angeles Wear, 500 rev.	AASHTO T 96	35 percent max.
Degradation	WSDOT Test Method 113	15 percent min.

All material within the structural earth wall reinforced zone shall meet the following chemical requirements:

Property	Test Method	Allowable Test Value
Resistivity	WSDOT Test Method 417	3,000 ohm-cm, min.
pH	WSDOT Test Method 417	5 to 10 (w/ wire reinf.)
pH	WSDOT Test Method 417	4.5 to 9 (w/ geogrid reinf.)
Chlorides	AASHTO T 291	100 ppm max.
Sulfates	AASHTO T 290	200 ppm max.

If the resistivity of the backfill material equals or exceeds 5,000 ohm-cm, the specified chloride and sulfate limits may be waived.

C. Proprietary Materials

Hilfiker Welded Wire Retaining Wall (WWW) System

Welded wire fabric wire size for backing mats shall be W2.1 minimum for wall face backing layers of 1'-6" maximum thickness, and shall be W2.9 minimum for wall face backing layers between 1'-6" and 2'-0".

Construction geotextile for wall facing shall conform to the requirements in Section 9-33.1 for Construction Geotextile for Underground Drainage, Moderate Survivability, Class A.

Tensar Wire Form Retaining Wall System

Wire support struts shall conform to AASHTO M 32, and shall be galvanized after fabrication in accordance with either ASTM A 641 (two ounces minimum per square foot) or AASHTO M 111. All damage to the galvanizing shall be repaired with one coat of Formula A-9-73 paint conforming to Section 9-08.2.

Geosynthetic connection rods shall be manufactured from high-density polyethylene with either fiberglass inclusions or oriented polypropylene, as recommended by Tensar Earth Technologies, Inc.

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Geosynthetic separating the wall facing backfill from the welded wire faced structural earth wall backfill shall conform to the requirements in Section 9-33.1 for Construction Geotextile for Underground Drainage, Moderate Survivability, Class A.

Tensar Geogrid Materials

Geogrid reinforcement and geosynthetic wall facing wrap shall conform to Section 9-33.1, and shall be a product listed in Appendix D of the current WSDOT Qualified Products List (QPL). The values of Tal and Tult as listed in the QPL for the products used shall meet or exceed the values required for the wall manufacturer's reinforcement design as specified in the structural earth wall design calculation and working drawing submittal.

The minimum ultimate tensile strength of the geogrid shall be a minimum average roll value (the average test results for any sampled roll in a lot shall meet or exceed the values shown in Appendix D of the current WSDOT QPL). The strength shall be determined in accordance with ASTM D 6637 for multi-rib specimens.

For geogrid reinforcement and geosynthetic wall facing wrap, the ultraviolet (UV) radiation stability, in accordance with ASTM D 4355, shall be a minimum of 70 percent strength retained after 500 hours in the weatherometer.

The longitudinal (i.e., in the direction of loading) and transverse (i.e., parallel to the wall or slope face) ribs that make up the geogrid shall be perpendicular to one another.

The Project Engineer will take random samples of the geogrid materials at the job site. Approval of the geogrid materials will be based on testing of samples from each lot. A "lot" shall be defined as all geogrid rolls sent to the project site produced by the same manufacturer during a continuous period of production at the same manufacturing plant having the same product name. The County will require 14 calendar days maximum for testing the samples after their arrival at the WSDOT Materials Laboratory in Tumwater, WA.

The geogrid samples will be tested for conformance to the specified material properties. If the test results indicate that the geogrid lot does not meet the specified properties, the roll or rolls which were samples will be rejected. Two additional rolls for each roll tested which failed from the lot previously tested will then be selected at random by the Project Engineer for sampling and retesting. If the retesting shows that any of the additional rolls tested do not meet the specified properties, the entire lot will be rejected. If the test results from all the rolls retested meet the specified properties, the entire lot minus the roll(s) which failed will be accepted.

All geogrid materials which have defects, deterioration, or damage, as determined by the Project Engineer, will be rejected. All rejected geogrid materials shall be replaced at no expense to the County.

Except as otherwise noted, geogrid identification, storage and handling shall conform to the requirements specified in Section 2-12.2. The geogrid materials shall not be exposed to temperatures less than –20F and greater than 122F.

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6-13.3 CONSTRUCTION REQUIREMENTS

The following is added at the end of this section.

Welded wire faced structural earth walls shall be constructed of only one of the following wall systems.

The Contractor shall make arrangements to purchase the welded wire mats, welded wire form facing units, geogrid reinforcement, backing mats, facing elements, fasteners, geosynthetic connection rods, construction geotextile for wall facing, and all necessary incidentals from the source identified for each wall system:

Hilfiker Welded Wire Retaining Wall (WWW) System

Hilfiker is a registered trademark of Hilfiker Retaining Walls.

Hilfiker Retaining Walls
P. O. Box 2012
Eureka, CA 95501-2012
(707) 443-5093
FAX (707) 443-2891

Tensar Wire Form Retaining Wall System

Tensar is a registered trademark of Tensar Corporation

Tensar Earth Technologies, Inc.
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6-13.3(1)A RISK MANAGEMENT (NEW SECTION)

1. The structural earth wall will experience settlement throughout the construction and settlement periods.

   Refer to Supplemental Geotechnical Report, Final Design, South Park Bridge, King County dated July 17, 2009 Section 8.3.2 – Fig. 22 and 23 for estimated settlements. These settlements may affect magnitude of lateral displacements of the wall, which in turn may affect wall tolerances and clearance between wire facing and concrete panels.

2. In the event structural earth wall settlements do not exceed the upper limit shown in Supplement Geotechnical Report Final Design Section 8.32 – Fig. 22 and 23 by more than ten percent of the settlement estimates, but the tolerances and clearances listed in Sections 6-13.3(1)C and 6-13.3(1)D for the wire facings and final walls, respectively, are exceeded, provide all necessary remedies to correct the impact of the exceeded tolerances on adjacent work to be performed. These remedies may include redesign and construction of copings, sidewalks, and concrete facing panel to wire facing connections as required to meet the final delineations shown on the Plans. Include a separate

engineering analysis to determine the structural integrity of the wall. If required, undertake remedial measures to correct structural deficiencies in the wall. All redesign shall be under the direction of and sealed by a Professional Engineer licensed in the State of Washington and submitted to the Project Engineer for approval.

3. In the event structural earth wall settlements are more than ten percent greater than those shown in Supplement Geotechnical Report Final Design Section 8.32 – Fig. 22 and 23, the Contractor may claim a change in conditions. Change in conditions shall be considered only if the Contractor has followed all installation procedures as required by the structural earth wall manufacturer or as specified herein, including compaction requirements for retained backfill.

6-13.3(1)B INITIAL SETTLEMENT PERIOD (NEW SECTION)

1. Allow 3 months for the initial 90 percent settlement of the structural earth retained backfill. If the initial settlement period exceeds 3 months, notify the Project Engineer.

2. The initial settlement period shall begin only after Stage 1 has been finished with the retained backfill materials placed and compacted to full height and the wire facing and soil reinforcing completely installed.

3. All settlement measurements shall be delivered to and become the property of King County at the completion of the Contract.

4. The initial settlement period shall be assumed complete upon approval of the Project Engineer only when magnitude of settlement for each cross section within a settlement zone has reached 90 percent of the actual ultimate settlement as provided in Supplement Geotechnical Report Final Design Section 8.32 – Fig. 22 and 23, and rate of settlement is decreasing.

5. After initial settlement period, height of structural earth wall shall be adjusted to compensate for wall settlements.

6. Construction of the second stage wall, cast-in-place copings, sidewalks, pedestrian handrails, and drainage and utilities within the zone of influence of the structural earth wall shall begin only upon completion of initial settlement period, but not prior to completion of all abutments of the approach spans, which could cause wall deformation or damage to the completed facing, unless noted otherwise.

7. As directed by the Project Engineer, Contractor may be required to make small repairs on adjacent private properties to such items as fences, sidewalks, driveways, or light poles due to damage resulting from settlement. This work is not shown on Plans, and shall be at the discretion of the Project Engineer.

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6-13.3(1)C QUALITY ASSURANCE FOR FIRST STAGE WALLS (NEW SECTION)

1. Wire facing of first stage walls shall meet the following tolerances at completion of initial settlement period:

2. Deviation from vertical (plumbness or lateral displacement) and horizontal alignment shall not exceed 4-inches when measured along a 10-foot edge.

3. Deviation from overall vertical plan of the wall (plumbness or lateral displacement from top to bottom) shall not exceed 1-inch per 10-feet of wall height.

4. Maximum outward bulge or lateral displacement of the face between wall backfill reinforcement layers of the wall shall not exceed 2-inches per 10-feet of wall height.

5. Deviation from bottom of wall elevations shall not exceed 3-inches. Deviation from top of wall elevations shall not exceed 1-inch. Bottom of wall elevations of first stage wire facing are based on existing ground elevations prior to wall construction.

6. Upon completion of initial settlement period, accumulative tolerances of the outward lateral displacements for bulging and plumbness of the wire facing at any location along the wall shall not exceed 6-inches.

6-13.3(1)D QUALITY ASSURANCE FOR SECOND STAGE WALLS (NEW SECTION)

The completed second stage walls shall meet the following tolerances:

1. Deviation from the vertical design batter and horizontal alignment shall not exceed ½-inch when measured along a 10-foot straight edge.

2. Deviation from the vertical design batter of the wall shall not exceed ½-inch per 10-feet of wall height.

3. Maximum allowable offset in any panel joint shall be ½-inch.

4. Base of retaining wall excavation shall be within 3-inches of staked elevations unless otherwise directed by the Project Engineer.

5. External wall dimensions shall be placed within 2-inches of staked locations.

6. Minimum structural thickness of concrete facing panels shall be 6.0-inches.

6-13.3(1)E TWO STAGE WALL CONSTRUCTION EXPERIENCE (NEW SECTION)

At start of wall construction, the structural earth wall manufacturer shall provide a qualified and experienced representative to resolve wall construction problems as directed by the Project Engineer. Qualified representatives shall have a minimum of 10 years experience in structural earth wall construction prior to the start of structural earth wall construction under this Contract. The Contractor shall implement recommendations made by the representative, as accepted by the

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Project Engineer. Subject to the Project Engineer's approval, the structural earth wall manufacturer may provide different representatives for the first stage and second stage wall construction periods.

6-13.3(2)A GEOTECHNICAL DESIGN PARAMETERS (NEW SECTION)

The following geotechnical design parameters shall be used for the design of the structural earth wall(s):

Soil Properties	Wall Backfill	Retained Soil	Foundation Soil
Unit Weight (pcf)	125	125	115
Friction Angle (deg)	35	35	29
Cohesion (psf)	0	0	0

	AASHTO Load Group I	AASHTO Load Group VII
Allowable Bearing Capacity (tsf)	1.25	1.75
Acceleration Coefficient (g)	N/A	0.23

6-13.3(3) EXCAVATION AND FOUNDATION PREPARATION

The following is added at the end of this section.

Prior to wall construction, improve foundation in accordance with Section 2-13, Earthquake Drains per the limit as shown in the Plans.

Prior to installing the earthquake drains, the foundation area shall be excavated to at least 12-inches below the bottom of wall. If the excavated surface will not support equipment, the foundation area shall be excavated an additional 12-inches, and a 12-inch thick working mat of base stone shall be constructed. The earthquake drains shall then be installed from this elevation. A reservoir of the earthquake drains system, a minimum of 12-inches thick, shall be installed so that the top elevation of the drainage blanket is level and equal to the elevation of the bottom of wall. Care shall be taken that the earthquake drains installed prior to beginning construction of the embankment are not fouled.

6-13.3(10) SOIL REINFORCMENT (NEW SECTION)

A. Bending of soil reinforcement in the horizontal direction (plane of reinforcement) that produces a permanent deformation in its alignment will not be allowed. Gradual bending that does not produce permanent deformation is allowed; however, design shall consider the effect of bending on pullout resistance and reinforcement stress including potential uneven stress distribution.

B. Skewing of soil reinforcement by rotating on the horizontal plane at connection to the concrete facing panel will be allowed within the following limits:

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1. The connection shall be structurally designed to rotate without bending and without altering the stress distribution at contact points.

2. The skew angles shall neither exceed 30 degrees nor AASHTO specifications limits.

C. Extra brackets may be cast into concrete facing panels and or wire facing connection locations may be shifted to reduce the horizontal and vertical skew angle of the connections between the soil reinforcements and concrete facing panels. Imbalance in restraint of a panel caused by asymmetry of the reinforcement connection locations shall be considered in determining the local equilibrium of individual facing panels. Calculations shall be provided to verify that there is sufficient restraint of each panel.

D. To minimize bulging of the first stage wire-facing wall, install continuous longitudinal and transverse horizontal soil reinforcement in each layer. Vertical spacing of transverse horizontal reinforcing within first stage wire-facing wall shall not exceed 24 inches.

6-13.3(11) FIRST STAGE WALL ERECTION - WIRE FACING (NEW SECTION)

A. Facing movements during construction are anticipated. Compensate for these movements to achieve tolerances specified in Section 6-13.3(1)B.

B. Place wire facing in successive horizontal lifts as retained backfill placement proceeds.

C. Place reinforcing normal to face of wall, unless otherwise shown in the Plans or directed by the Project Engineer. Compact retained backfill prior to placement of reinforcing.

D. During construction of wire-facing wall, place ties or geogrid tabs such that they project beyond the wire wall face for embedment or attachment to concrete facing panels.

E. If geogrid tabs are used place in accordance with Standard Specification Section 2-12.3, Construction Requirements, and as specified below:

1. Stretch out geogrid in direction perpendicular to wall face to remove all slack and wrinkles, and hold geogrid in place with soil piles or other methods as recommended by manufacturer before placing backfill material over geogrid to required cover.

2. Geogrid reinforcement shall be continuous in direction perpendicular to wall from wire facing to last geogrid node at end of specified reinforcement length. Geogrid splices parallel to the wall face will not be allowed.

6-13.3(12) RETAINED BACKFILL PLACEMENT - FIRST STAGE WALL (NEW SECTION)

A. Retained backfill placement within Structural Earth Wall reinforced zone shall closely follow erection of each course of wire facing.

B. Place retained backfill such that segregation does not occur. Retained backfill shall be placed to avoid damage or disturbance to the wall materials, or misalignment of wire facing.

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Mixing of retained backfill materials during placement in the wall to meet Contract backfill gradation requirements shall not be allowed.

C. Wall reinforcing or wire facing that becomes damaged or disturbed during retained backfill placement shall be either removed and replaced, or repaired and corrected as directed by the Project Engineer.

D. The moisture content of retained backfill material prior to and during compaction shall be uniformly distributed throughout each layer of material:

1. The moisture content of all retained backfill material shall meet the requirements of Standard Specification Section 2-03.3(14)C, Method C.

2. Retained backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift.

3. The Optimum Moisture Content shall be determined in accordance with Standard Specification Section 2-03.3(14)D.

E. Retained backfill shall be compacted to 95-percent of the maximum density as specified under Compacting Earth Embankments, Method C, in Standard Specification Section 2-03.3(14)C, except as modified herein:

1. Relative compaction shall be determined by Modified Proctor compaction test ASTM D1557,

2. The maximum lift thickness after compaction shall not exceed 10-inches. For an Tensar ARES wall, the minimum compacted backfill lift thickness of the first lift above each geogrid reinforcement layer shall be 6-inches.

3. Decrease this lift thickness, if necessary, to obtain the specified density.

4. Do not use sheepsfoot rollers or rollers with protrusions for compacting backfill with geogrid reinforcement. Rollers with mass greater than 6,000 pounds shall be used with vibrator turned off. Rollers with mass less than or equal to 6,000 pounds may be used with vibrator turned on only with prior authorization of Project Engineer.

5. Reinforce zone within 3-feet of back of wire facing wall without causing damage to or distortion of wire facing by using light mechanical tampers approved by the Project Engineer. No standard soil density tests shall be taken within this area; however, other methods of assessing soil compaction, such as probing, will be performed to assess the adequacy and uniformity of soil compaction.

F. If geogrid reinforcing is used, place retained backfill in accordance with Standard Specification Section 2-12.3, and as specified herein:

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1. Do not end dump fill material directly on the geogrid reinforcement unless otherwise accepted by the Project Engineer.

2. Ensure that 6-inches minimum of retained backfill is between geogrid reinforcement and any construction vehicle or equipment tires or tracks at all times.

G. At the end of each day's operation, shape last level of backfill to permit runoff of rainwater away from wall face. Surface runoff from adjacent areas shall not be allowed to enter the wall construction site.

H. At completion of initial settlement period and all construction activity that could cause wall deformation or damage to the completed facing, and prior to placement of second stage wall, remove or add fill as necessary to construct the fill to final elevations as required.

6-13.3(13) SECOND STAGE WALL ERECTION - CONCRETE FACING PANELS (NEW SECTION)

A. Install concrete facing panels only after completion of initial settlement period, as defined in Section 6-13.3(1)B, and after removal (if necessary) of first stage wall to final elevations.

B. Backfill placement shall closely follow erection of each course of panels. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the panels. Misalignment or distortion of panels due to placement of backfill shall be corrected as directed by the Project Engineer.

C. No compaction shall be required for backfill placed between concrete facing panels and wire facing, where required.

D. Wall materials that become damaged or disturbed during backfill placement shall be removed and replaced, or repaired and corrected, as directed by the Project Engineer.

E. Place panels vertically. For erection, handle panels by means of a lifting device set into upper edge of panels. Locate lifting device in 1-1/4 inch diameter maximum recess. Depth of recess to be per manufacturer's recommendation to allow cutoff of device 1-inch below surface of concrete. After lifting device is cut, coat remaining portion of device with Galvacon, allow to dry, and fill concrete recess with approved grout to match color of adjacent concrete.

F. Place panels in successive horizontal lifts in accordance with sequence approved in Shop Drawings as backfill placement proceeds.

G. External bracing shall be provided for initial lift.

H. Excavate as required to facilitate construction of concrete leveling pad.

I. As backfill material is placed between first stage wall and back of facing panels, maintain panels in position using appropriate methods, e.g. using temporary wooden wedges placed in joints at the junction of adjacent panels on the external side of the wall.

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J. Ties connecting concrete panels to soil reinforcing elements shall be placed within 20 degrees from normal with respect to face of wall, unless otherwise approved by Project Engineer. Ensure that no voids exist directly beneath tie connections.

K. Clean loop pockets and access pockets of the internal connection channel of Structural Earth Wall and wall concrete panels of all backfill and extraneous materials prior to inserting pins to connect backfill reinforcing mesh to each concrete facing panel.

L. Repair panels as necessary or directed by the Project Engineer in accordance with approved repair procedure.

6-13.4 MEASUREMENT

The following is added at the end of this section:

Traffic Barrier – SEW will be measured as specified in Section 6-10.4 for cast-in-place concrete barrier.

Wall Coping for Pedestrian Railing will be measured as specified in Section 6-11.4.

No measurement or payment will be made for Contractor designed temporary shoring. All costs in connection with Contractor designed temporary shoring shall be included in related bid items.

6-13.5 PAYMENT

The following is added at the end of the eighth paragraph:

The unit Contract price for Traffic Barrier-SEW shall include furnishing and installing steel railing along the top of the SEW traffic barrier as specified in Section 6-10.5.

The unit Contract price per linear foot for "Wall Coping for Pedestrian Railing" shall be full pay for constructing the coping on top of the SEW and CIP walls as specified in Section 6-11.5.

6-19 SHAFTS (NEW SECTION)

6-19.1 DESCRIPTION

This Work shall consist of furnishing all materials, labor, tools, equipment, services and incidentals necessary to construct the shafts in accordance with the Plans, the Standard Specifications, and the Special Provisions. There are no requirements for permanent casing to be utilized for shafts in this Contract.

6-19.2 MATERIALS

6-19.2(1) CASING

A. All permanent casing shall be of steel base metal conforming to ASTM A36. All permanent casing shall be of ample strength to resist damage and deformation from transportation and handling, installation stresses, and all pressures and forces acting on the casing.

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All temporary casing shall be a smooth wall structure of steel base metal, except where corrugated metal pipe is shown in the Plans as an acceptable alternative material. All temporary casing shall be of ample strength to resist damage and deformation from transportation and handling, installation and extraction stresses, and all pressures and forces acting on the casing. The casing shall be capable of being removed without deforming and causing damage to the completed shaft, and without disturbing the surrounding soil.

B. Permanent casing is defined as casing designed as part of the shaft structure and installed to remain in place after construction is complete. Temporary casing is defined as casing installed to facilitate shaft construction only, which is not designed as part of the shaft structure, and which shall be completely removed after shaft construction is complete, unless otherwise shown in the Plans.

C. The casing shall be watertight and clean prior to placement in the excavation.

D. The outside diameter of the casing shall not be less than the specified diameter of the shaft. The inside diameter of the casing shall not be greater than the specified diameter of the shaft plus six inches, except as otherwise noted for shafts 5'-0" or less in diameter, and as otherwise noted in subsection 6-19.3(3)C of this Special Provision for temporary telescoping casing. The inside diameter of casings for shafts 5'-0" or less in diameter shall not be greater than the specified diameter of the shaft plus 1'-0".

E. Where the minimum thickness of the casing is specified in the Plans, it is specified to satisfy structural design requirements only. The Contractor shall increase the casing thickness as necessary to satisfy the requirements of item A of this section.

6-19.2(2) REINFORCING STEEL

A. Reinforcing steel used in the construction of shafts shall conform to Section 9-07.

B. Steel reinforcing bar centralizers shall be steel, conforming to the details shown in the Plans. The Contractor may propose the use of alternative steel reinforcing bar devices as part of item 7 of the shaft installation plan submittal, as specified in subsection 6-19.(2)B of this Special Provision, subject to the Project Engineer's review and approval of such devices.

6-19.2(3) CONCRETE

A. Concrete used in the construction of shafts shall be Class 4000P conforming to Section 6-02.

B. When shafts are constructed in water, the concrete used for the casing shoring seal shall be Class 4000W conforming to Section 6-02.

6-19.2(4) SLURRY

Slurry shall conform to one of the following:

A. Mineral Slurry

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1. Mineral slurry shall conform to the following requirements:

Property	Test	Requirement
Density (pcf)	Mud Weight (Density) API 13B-1, Section 1	64.3 to 75
Viscosity (seconds/quart)	Marsh Funnel and Cup API 13b-1, Section 2.2	26 to 50
PH	Glass Electrode, pH Meter, or pH Paper	8 to 11
Sand Content (percent)	Sand API 13B-1, Section 5	
-prior to final cleaning		4.0 max.
-immediately prior to placing concrete		4.0 max.

Use of mineral slurry in salt water installations will not be allowed.

Slurry temperature shall be at least 40F when tested.

B. Synthetic Slurries

1. Synthetic slurries shall be used in conformance with the manufacturer's recommendations, the quality control plan specified in subsection 6-19.3(2)B.5 of this Special Provision, and these Special Provisions. The following synthetic slurries are approved as slurry systems, with additives that have been load tested for the California Department of Transportation:

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Product	Manufacturer
Novagel	Geo-Tech Services, LLC 220 North Zapata Highway, Suite 11A Laredo, TX 78043-4464
ShorePac GCV	CETCO 1500 West Shure Drive Arlington Heights IL, 60004
SlurryPro CDP	KB International, LLC Suite 216, 735 Broad Street Chattanooga, TN 37402-1855
Super Mud*	PDS Company 8140 East Rosecrans Ave. Paramount, CA 90723-2754

*Approval as a product applies to the liquid product only.

Other synthetic slurry products may be approved for use provided the product meets the acceptance criteria established by WSDOT, including status as an approved synthetic slurry (with load tested additives) with the California Department of Transportation (Caltrans).

2. The sand content of synthetic slurry prior to final cleaning and immediately prior to placing concrete shall be less than 2.0 percent, in accordance with API 13B-1, Section 5.

C. Water Slurry (with or without site soils)

1. Water with or without site soils may be used as slurry when casing is used for the entire length of the drilled hole. Use of water slurry without full length casing may only be used with the approval of the Project Engineer.

2. Water slurry shall conform to the following requirements:

Property	Test	Requirement
Density (pcf)	Mud Weight (Density) API 13B-1, Section 1	65 max.
Sand Content (percent)	Sand API 13B-1, Section 5	1.0 max.

Use of water slurry in salt water installations will not be allowed.

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Slurry temperature shall be at least 40F when tested.

6-19.2(5) ACCESS TUBES FOR CROSSHOLE SONIC LOG TESTING

A. Access tubes for crosshole sonic log testing shall be steel pipe of 0.145 inches minimum wall thickness and at least 1-1/2 inch inside diameter.

B. The access tubes shall have a round, regular inside diameter free of defects and obstructions, including all pipe joints, in order to permit the free, unobstructed passage of 1.3 inch maximum diameter source and receiver probes used for the crosshole sonic log tests. The access tubes shall be watertight, free from corrosion with clean internal and external faces to ensure good bond between the concrete and the access tubes. The access tubes shall be fitted with watertight threaded PVC caps on the bottom and the top.

6-19.2(6) GROUT

A. Grout for filling the access tubes at the completion of the crosshole sonic log tests shall be a neat cement grout with a maximum water/cement ratio of 0.45.

6-19.3 CONSTRUCTION REQUIREMENTS

6-19.3(1) QUALITY ASSURANCE

A. Shaft Construction Tolerances

1. Shafts shall be constructed so that the center at the top of the shaft is within the following horizontal tolerances:

Shaft Diameter	Tolerance
Less than or equal to 2'-0"	3"
Greater than 2'-0" and less than 5'-0"	4"
5'-0" or larger	6"

2. Shafts shall be within 1.5 percent of plumb. For rock excavation, allowable tolerance can be increased to 2 percent max.

3. During drilling or excavation of the shaft, the Contractor shall make frequent checks on the plumbness, alignment, and dimensions of the shaft. Any deviation exceeding the allowable tolerances shall be corrected with a procedure approved by the Project Engineer.

4. Shaft steel reinforcing bar placement tolerances shall conform to Section 6-02.3(24)C.

B. Nondestructive Testing of Shafts

1. Unless otherwise specified in this Special Provision, the Contracting Agency will perform crosshole sonic log testing of specific shafts, except for those constructed

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completely in the dry, selected in accordance with subsection 6-19.3(9)A of this Special Provision. The Contractor shall accommodate the crosshole sonic log testing by furnishing and installing access tubes in accordance with subsection 6-19.3(6)A of this Special Provision.

C. Shaft Preconstruction Conference

1. A shaft preconstruction conference shall be held at least five working days prior to the Contractor beginning any shaft construction work at the site to discuss construction procedures, personnel, and equipment to be used, and other elements of the approved shaft installation plan as specified in subsection 6-19.3(2)B of this Special Provision. If synthetic slurry is used to construct the shafts, the frequency of scheduled site visits to the project site by the synthetic slurry manufacturer's representative will be discussed. The list of materials specified in the Record of Materials (ROM) form for this item of work will also be discussed. Those attending shall include:

   a. (representing the Contractor) The superintendent, on site supervisors, and all foremen in charge of excavating the shaft, placing the casing and slurry as applicable, placing the steel reinforcing bars, and placing the concrete. If synthetic slurry is used to construct the shafts, the slurry manufacturer's representative and a Contractor's employee trained in the use of the synthetic slurry, as identified to the Project Engineer in accordance with subsection 6-19.3(2)C of this Special Provision, shall also attend.

   b. (representing the Contracting Agency) The Project Engineer, key inspection personnel, and representatives from KCDOT Construction Management Unit, Engineering Services Section and Materials Laboratory.

2. If the Contractor's key personnel change, or if the Contractor proposes a significant revision of the approved shaft installation plan, an additional conference shall be held before any additional shaft construction operations are performed.

6-19.3(2) SUBMITTALS

A. Construction Experience

1. Prior to the start of drilled shaft construction, the Contractor shall submit four copies of a project reference list to the Project Engineer for approval verifying the successful completion by the Contractor of at least three separate foundation projects using oscillator method for shaft excavation with drilled shafts of diameters, depths, and ground conditions equal to or larger than those shown in the Plans. A brief description of each project and the owner's contact person's name and current phone number shall be included for each project listed.

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2. Prior to the start of drilled shaft construction, the Contractor shall submit four copies of a list identifying the on-site supervisors, and drill rig operators assigned to the project to the Project Engineer for approval. The list shall contain a detailed summary of each individual's experience in shaft excavation operations with temporary casing using oscillator method, and placement of assembled steel reinforcing bar cages and concrete in shafts.

   a. On-site supervisors shall have a minimum two years experience in supervising construction of drilled shaft foundations of similar size (diameter and depth) and scope to those shown in the Plans, and similar geotechnical conditions to those described in the geotechnical report and summary of geotechnical conditions. The work experience shall be direct supervisory responsibility for the on-site shaft construction operations. Project management level positions indirectly supervising on-site shaft construction operations is not acceptable for this experience requirement.

   b. Drill rig operators shall have a minimum one year experience in construction of drilled shaft foundations.

3. The Project Engineer will approve or reject the Contractor's qualifications and field personnel within 10 working days after receipt of the submission. Work shall not be started on any drilled shaft until the Contractor's qualifications and field personnel are approved by the Project Engineer. The Project Engineer may suspend the drilled shaft construction if the Contractor submits or substitutes unqualified personnel. The Contractor shall be fully liable for the additional costs resulting from the suspension of work and no adjustments in Contract time resulting from the suspension of work will be allowed.

B. Shaft Installation Plan

The Contractor shall submit four copies of a shaft installation narrative for approval by the Project Engineer. In preparing the narrative, the Contractor shall reference the available subsurface data provided in the Contract test hole boring logs, the Summary of Geotechnical Conditions provided in the Appendix to the Special Provisions, and the geotechnical report(s) prepared for this project. This narrative shall provide at least the following information:

1. An overall construction operation sequence and the sequence of drilled shaft construction.

2. List, description and capacities of proposed equipment, including but not limited to cranes, drills, auger, bailing buckets, final cleaning equipment and drilling unit. The narrative shall describe why the equipment was selected, and describe equipment suitability to the anticipated site and subsurface conditions. The narrative shall include a project history of the drilling equipment demonstrating

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the successful use of the equipment on shafts of equal or greater size in similar soil/rock conditions.

3. Details of shaft excavation methods, including proposed drilling methods, methods for cleanout of the shafts and a disposal plan for excavated material and drilling slurry (if applicable). This shall include a review of method suitability to the anticipated site and subsurface conditions.

4. Details of the method(s) to be used to ensure shaft stability (i.e., prevention of caving, bottom heave, etc. using temporary casing, slurry, or other means) during excavation (including pauses and stoppages during excavation) and concrete placement. This shall include a review of method suitability to the anticipated site and subsurface conditions. If casings are proposed or required, casing dimensions and detailed procedures for permanent casing installation, temporary casing installation and removal, and methods of advancing temporary and permanent casing with the excavation in accordance with subsection 6-19.3(B) of this Special Provision, shall be provided.

5. Detailed procedures for mixing, using, maintaining, and disposing of the slurry shall be provided. A detailed mix design (including all additives and their specific purpose in the slurry mix), and a discussion of its suitability to the anticipated subsurface conditions, shall also be provided for the proposed slurry.

The submittal shall include a detailed plan for quality control of the selected slurry, including tests to be performed, test methods to be used, and minimum and/or maximum property requirements which must be met to ensure that the slurry functions as intended, considering the anticipated subsurface conditions and shaft construction methods, in accordance with the slurry manufacturer's recommendations and these Special Provisions. As a minimum, the slurry quality control plan shall include the following tests:

Property	Test Method
Density	Mud Weight (Density), API 13B-1, Section 1
Viscosity	Marsh Funnel and Cup,
	API 13B-1, Section 2.2
PH	Glass Electrode, pH Meter, or pH Paper
Sand Content	Sand, API 13B-1, Section 5

6. The method used to fill or eliminate all voids below the top of shaft between the plan shaft diameter and excavated shaft diameter, or between the shaft casing and surrounding soil, if permanent casing is specified.

7. Reinforcing steel shop drawings, details of reinforcement placement, including bracing, centering, and lifting methods, and the method to assure the reinforcing

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cage position is maintained during construction, including use of bar boots and/or rebar cage base plates, and including placement of rock backfill below the bottom of shaft elevation provided the conditions of subsection 6-19.3(5)D of this Special Provision are satisfied.

8. Details of concrete placement, including proposed operational procedures for pumping methods, and a sample uniform yield form to be used by the Contractor for plotting the volume of concrete placed versus the depth of shaft for all shaft concrete placement (except concrete placement in the dry).

9. The method to be used to form an emergency horizontal construction joint during concrete placement.

10. Description of the material used to temporarily backfill a shaft excavation during a stoppage of the excavation operation, as well as the method used to place and remove the material.

11. When shafts are constructed in water, the submittal shall include seal thickness calculations, seal placement procedure, and descriptions of provisions for casing shoring dewatering and flooding.

The Project Engineer will evaluate the shaft installation plan for conformance with the Plans, Specifications and Special Provisions, within the review time specified in Section 6-01.9. At the option of the Contracting Agency, a Shaft Installation Plan Submittal Meeting may be scheduled following review of the Contractor's initial submittal of the plan. Those attending the Shaft Installation Plan Submittal Meeting, if held, shall include the following:

a. (representing the Contractor) The superintendent, on-site supervisors, and other Contractor personnel involved in the preparation of the shaft installation plan.

b. (representing the Contracting Agency) The Project Engineer and Contracting Agency personnel involved with the structural, geotechnical, and construction review of the shaft installation plan.

C. Slurry Technical Assistance

1. If slurry other than water slurry is used to construct the shafts, the Contractor shall provide or arrange for technical assistance in the use of the slurry as specified in subsection 6-19.3(4)A.1 of this Special Provision. The Contractor shall submit four copies of the following to the Project Engineer:

a. The name and current phone number of the slurry manufacturer's technical representative assigned to the project.

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b. The name(s) of the Contractor's personnel assigned to the project and trained by the slurry manufacturer in the proper use of the slurry. The submittal shall include a signed training certification letter from the slurry manufacturer for each trained Contractor's employee listed, including the date of the training.

D. Work shall not begin until all the required submittals have been approved in writing by the Project Engineer. All procedural approvals given by the Project Engineer will be subject to trial in the field and shall not relieve the Contractor of the responsibility to satisfactorily complete the Work.

6-19.3(3) SHAFT EXCAVATION

A. Shafts shall be excavated to the required depth as shown in the Plans. Shaft excavation operations shall conform to this Special Provision and the shaft installation plan as approved by the Project Engineer, except as otherwise specified by the Project Engineer. Once the excavation operation has been started, the excavation shall be conducted in a continuous operation until the excavation of the shaft is completed, except for pauses and stops as noted, using approved equipment capable of excavating through the type of material expected. Pauses during this excavation operation, except for casing splicing, tooling changes, slurry maintenance, and removal of obstructions, are not allowed. Contractor shall provide temporary casing at the site in sufficient quantities to meet the needs of the anticipated construction method.

Pauses, defined as momentary interruptions of the excavation operation, will be allowed only for casing splicing, tooling changes, slurry maintenance, and removal of obstructions. Shaft excavation operation interruptions not conforming to this definition shall be considered stops.

If the shaft excavation is not complete at the end of the shift or series of continuous shifts, the shaft excavation operation may be stopped, provided the following conditions are met. The Contractor shall, before the end of the work day, either install casing in the hole to the depth of the excavation and either the Plan diameter of the shaft or the actual excavated diameter of the hole, whichever is greater, or backfill the hole with material approved by the Project Engineer in accordance with subsection 6-19.3(2)B.10 of this Special Provision. The Contractor shall backfill the hole to the ground surface, is the excavation is not cased, or to a minimum of five feet about the bottom of the casing, if the excavation is cased. Backfilling of shafts with casing fully seated into rock, as determined by the Project Engineer, will not be required. If slurry is present in the shaft excavation, the Contractor shall conform to the requirements of subsection 6-19.3(4)B of this Special Provision regarding the maintenance of the minimum level of drilling slurry throughout the stoppage of the shaft excavation operation, and shall recondition the slurry to the required slurry properties in accordance with subsection 6-19.3(4) of this Special Provision prior to recommencing shaft excavation operations.

B. The Contractor shall furnish and install casings as follows:

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Bridge No.	Bridge Pier Number	Casing Type	Elev. Of Bottom of Required Casing (ft)	Casing Type	Elev. Of Bottom of Required Casing (ft)
South Park Bridge #3179	Abut 1	Temp.	-81.00	--	--
	Pier 2	Temp.	-105.00	--	--
	Pier 5	Temp.	-114.50	--	--
	Abut 6	Temp.	-86.00	--	--
	SE Art Feature	Temp.	+3.00		
	SW Art Feature	Temp.	+5.25		
	NE Art Feature	Temp.	+0.50		
	NW Art Feature	Temp.	+0.50		

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All shafts shall be drilled with a full depth temporary casing. Shaft casing shall be equipped with cutting teeth or a cutting shoe to provide positive cut, and installed by oscillating the casing. Drilled casing shall be oscillatory advanced concurrent, or in advance of any drilling operation. Installing the casing by vibratory means will not be allowed.

When installing required temporary or required permanent casings between the upper and lower elevation limits specified above, the casing shall be advanced prior to or concurrently with the elevation. Excavation in advance of the casing tip shall not exceed casing tip, except that in no case shall shaft excavation and casing placement extend below the bottom of shaft excavation as shown in the Plans.

To maintain stable excavations and to facilitate construction, the Contractor may furnish and install temporary casing in addition to the required casing specified above. The Contractor shall provide temporary casing at the site in sufficient quantities to meet the needs of the anticipated construction method.

C. Use of temporary telescoping casing for the shafts at any bridge piers is not allowed.

D. The Contractor shall conduct casing installation and removal operations and shaft excavation operations such that the adjacent soil outside the casing and shaft excavation for the full height of the shaft is not disturbed. Disturbed soil is defined as soil whose

geotechnical properties have been changed from those of the original in-situ soil, and whose altered condition adversely affects the structural integrity of the shaft foundation.

E. Shaft excavations shall not be left open overnight unless cased full depth. An open shaft excavation is defined as a shaft excavation that has not been filled with concrete, or temporarily backfilled with a material approved by the Project Engineer in accordance with subsection 6-19.3(2)B.10 of this Special Provision.

F. The Contractor shall use appropriate means such as a cleanout bucket or air lift to clean the bottom of the excavation of all shafts. No more than 2 inches of loose or disturbed material shall be present at the bottom of the shaft just prior to placing concrete.

G. The excavated shaft shall be inspected and approved by the Project Engineer prior to proceeding with construction. The bottom of the excavated shaft shall be sounded with an airlift pipe, a tape with a heavy weight attached to the end of the tape, or other means acceptable to the Project Engineer to determine that the shaft bottom meets the requirements in the Contract.

H. When obstructions are encountered, the Contractor shall notify the Project Engineer promptly. An obstruction is defined as a specific object (including, but not limited to, boulders, logs, and manmade objects) encountered during the shaft excavation operation which prevents or hinders the advance of the shaft excavation. When efforts to advance past the obstruction to the design shaft tip elevation result in the rate of advance of the shaft drilling equipment being significantly reduced relative to the rate of advance for the portion of the shaft excavation in the geological unit that contains the obstruction, then the Contractor shall remove, break-up, or push aside, the obstruction under the provisions of subsection 6-19.5.B of this Special Provision. The method of dealing with such obstructions, and the continuation of excavation shall be as proposed by the Contractor and approved by the Project Engineer.

I. Permanent casing is not required for any pier shafts.

J. Drilling equipment shall not be operated from an existing bridge, except as otherwise noted. If necessary and safe to do so, and if the Contractor submits a written request to the Project Engineer in accordance with Section 6-01.6, the Project Engineer may approve the operation of drilling equipment on a bridge.

K. When shafts are constructed in water, the Contractor shall construct a seal between the casing shoring and the upper portion of the permanent casing for the shaft as shown in the Plans, in accordance with the shaft installation plan specified in subsection 6-19.3(2)B.13 of this Special Provision, and as approved by the Project Engineer.

The seal thickness shown in the Plans is designed to resist the hydrostatic uplift force with the corresponding seal weight and adhesion of the seal to the permanent casing and the casing shoring of 20 psi, based on the casing shoring dimension and the seal vent water surface elevation specified in the Plans. If the Contractor uses a casing shoring diameter other than that specified in the Plans, the Contractor shall submit a revised seal

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design to the Project Engineer for approval in accordance with subsection 6-19.3(2)B.13 of this Special Provision.

If, in the opinion of the Project Engineer, water conditions at the time of construction allow the seal vent water surface elevation to be lowered, the Contractor may revise the casing shoring seal by submitting a revised seal design to the Project Engineer for approval in accordance with subsection 6-19.3(2)B.13 of this Special Provision.

L. The Contractor shall use slurry, in accordance with subsection 6-19.3(4) of this Special Provision, to maintain a stable excavation during excavation and concrete placement operations once water begins to enter the shaft excavation and remain present.

6-19.3(4) SLURRY INSTALLATION REQUIREMENTS

A. Slurry Technical Assistance

1. If slurry other than water slurry is used, the manufacturer's representative, as identified to the Project Engineer in accordance with subsection 6-19.3(2)C of this Special Provision, shall:

   a. provide technical assistance for the use of the slurry,

   b. shall be at the site prior to introduction of the slurry into a drilled hole, and

   c. shall remain at the site during the construction and completion of a minimum of one shaft to adjust the slurry mix to the specific site conditions.

2. After the manufacturer's representative is no longer present at the site, the Contractor's employee trained in the use of the slurry, as identified to the Project Engineer in accordance with subsection 6-19.3(2)C of this Special Provision, shall be present at the site throughout the remainder of shaft slurry operations for this project to perform the duties specified in items 1a through 1c above.

B. Minimum Level of Slurry in the Excavation

1. When slurry is used to maintain a stable excavation, the slurry level in the excavation shall be maintained above the groundwater level the greater of the following dimensions, except as otherwise noted in subsection 6-19.3(4)B.3 of this Special Provision:

   a. not less than five feet for mineral slurries,

   b. not less than ten feet for water slurries,

   c. not less than ten feet for synthetic slurries, except when a lesser dimension is specifically recommended by the slurry manufacturer for the site conditions and construction method, and is supported by slurry material property, mix, and maintenance requirements submitted as part of item 5 of the shaft

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installation plan in accordance with subsection 6-19.3(2)B of this Special Provision,

d. one shaft diameter,

e. dimension as required to provide and maintain a stable hole.

The Contractor shall provide casing, or other means, as necessary to meet these requirements.

2. The slurry level shall be maintained above all unstable zones a sufficient distance to prevent bottom heave, caving or sloughing of those zones.

3. Throughout all stops in shaft excavation operations, as specified in subsection 6-19.3(3)A of this Special Provision, the Contractor shall monitor and maintain the slurry level in the excavation the greater of the following elevations:

a. no lower than the water level elevation outside the shaft,

b. elevation as required to provide and maintain a stable hole.

C. Slurry Sampling and Testing

1. Mineral slurry and synthetic slurry shall be mixed and thoroughly hydrated in slurry tanks, ponds, or storage areas. The Contractor shall draw sample sets from the slurry storage facility and test the samples for conformance with the appropriate specified material properties before beginning slurry placement in the drilled hole. Mineral slurry shall conform to the material specifications in subsection 6-19.2(4)A of this Special Provision. Synthetic slurry shall conform to the quality control plan included in the shaft installation plan in accordance with subsection 6-19.3(2)B.5 of this Special Provision and as approved by the Project Engineer. A sample set shall be composed of samples taken at mid-height and within two feet of the bottom of the storage area.

2. The Contractor shall sample and test all slurry in the presence of the Project Engineer, unless otherwise directed. The date, time, names of the persons sampling and testing the slurry, and the results of the tests shall be recorded. A copy of the recorded slurry test results shall be submitted to the Project Engineer at the completion of each shaft, and during construction of each shaft when requested by the Project Engineer.

3. Sample sets of all slurry, composed of samples taken at mid-height and within two feet of the bottom of the shaft, shall be taken and tested during drilling as necessary to verify the control of the properties of the slurry. As a minimum, sample sets of synthetic slurry shall be taken and tested at least once every four hours after beginning its use during each shift. Sample sets of all slurry shall be taken and tested at least once every two hours if the slurry is not recirculated in the drilled hole or if the previous sample set did not have consistent specified

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properties. All slurry shall be recirculated, or agitated with the drilling equipment, when tests show that the sample sets do not have consistent specified properties.

4. Sample sets of all slurry, as specified, shall be taken and tested prior to final cleaning of the bottom of the hole and again just prior to placing concrete. Cleaning of the bottom of the hole and placement of the concrete shall not start until tests show that the samples taken at mid-height and within two feet of the bottom of the hole have consistent specified properties.

D. The Contractor shall clean, recirculate, de-sand, or replace the slurry to maintain the required slurry properties.

E. The Contractor shall demonstrate to the satisfaction of the Project Engineer that stable conditions are being maintained. If the Project Engineer determines that stable conditions are not being maintained, the Contractor shall immediately take action to stabilize the shaft. The Contractor shall submit a revised shaft installation plan which addresses the problem and prevents future instability. The Contractor shall not continue with shaft construction until the damage which has already occurred is repaired in accordance with the specifications, and until receiving the Project Engineer's approval of the revised shaft installation plan.

F. When mineral slurry, conforming to subsection 6-19.2(4)A of this Special Provision, is used to stabilize the unfilled portion of the shaft, the Contractor shall remove the excess slurry buildup inside of the shaft diameter prior to continuing with concrete placement. The Contractor shall use the same methods of shaft excavation and the same diameter of drill tolls to remove the excess slurry buildup as was used to excavate the shaft to its current depth.

G. The Contractor shall dispose of the slurry as specified in the shaft installation plan as approved by the Project Engineer, and in accordance with the following requirements:

1. Water slurry may be infiltrated to uplands within the confines of the Contracting Agency Right Of Way for the project, provided that the groundline at the disposal site is at least five feet above the current water table, and that disposal operations conform to the temporary erosion and sedimentation control (TESC) requirements established for this project. For the purposes of water slurry disposal, upland is defined as an area that has no chance of discharging directly to waters of the State, including wetlands or conveyances that indirectly lead to wetlands or waters of the State.

2. Synthetic and mineral slurries shall be contained and disposed of at a waste water treatment facility or into a sanitary sewer in accordance with the Contractor's permit requirements.

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6-19.3(5) ASSEMBLY AND PLACEMENT OF REINFORCING STEEL

A. The reinforcing cage shall be rigidly braced to retain its configuration during handling and construction. Individual or loose bars will not be permitted. The Contractor shall show bracing and any extra reinforcing steel required for fabrication of the cage on the shop drawings.

B. The reinforcement shall be carefully positioned and securely fastened to provide the minimum clearances listed below, and to ensure that no displacement of the reinforcing steel bars occurs during placement of the concrete. The steel reinforcing bars shall be securely held in position throughout the concrete placement operation. The Contractor shall submit details of the proposed reinforcing cage spacers along with the shop drawings. The reinforcing steel spacers at each longitudinal space plane shall be placed at least at the quarter points around the circumference of the steel reinforcing bar cage, and at a maximum longitudinal spacing of either 2.5 times the shaft diameter or 20'-0", whichever is less.

C. Place bars as shown in the Contract Plans with minimum concrete cover as shown in the table below.

Shaft Diameter	Minimum Concrete Cover
Less than or equal to 3'-0"	3"
Greater than 3'-0" and less than 5'-0"	4"
5'-0" or larger	6"

D. For shafts with temporary casing within 15 feet of the bottom of shaft elevation as specified in the Plans, the Contractor may place quarry spalls or other rock backfill approved by the Project Engineer into the shaft below the specified bottom of shaft elevation as a means to support the steel reinforcing bar cage, provided that the materials and means to accomplish this have been addressed by the shaft installation plan as approved by the Project Engineer, as specified in subsection 6-19.3(2)B.7 of this Special Provision. The use of bar boots and/or rebar cage base plates is required when quarry spalls or other rock backfill is placed at the base of the shaft excavation.

E. Shaft excavation shall not be started until the Contractor has received approval from the Project Engineer for the reinforcing steel spacers required when the casing is to be pulled during concrete placement.

6-19.3(6) ACCESS TUBES FOR CROSSHOLE SONIC LOG TESTING

A. The Contractor shall install access tubes for crosshole sonic log testing in all drilled shafts, except as otherwise noted, to permit access for the crosshole sonic log test probes. If, in the opinion of the Project Engineer, the condition of the shaft excavations permit shaft construction in the dry, the Project Engineer may specify that the access tubes be omitted.

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B. The Contractor shall securely attach the access tubes to the interior of the reinforcement cage of the shaft. One access tube shall be furnished and installed for each foot of shaft diameter, rounded to the nearest whole number, as shown in the Plans. The number of access tubes for shaft diameters specified as "X feet 6 inches" shall be rounded up to the next higher whole number. The access tubes shall be placed around the shaft, inside the spiral or hoop reinforcement and bundled with the vertical reinforcement.

C. The access tubes shall be installed in straight alignment and as near to parallel to the vertical axis of the reinforcement cage as possible. The access tubes shall extend from the bottom of the reinforcement cage to at least two feet above the top of the shaft. Splice joints in the access tubes, if required to achieve full length access tubes, shall be watertight. The Contractor shall clear the access tubes of all debris and extraneous materials before installing the access tubes. Care shall be taken to prevent damaging the access tubes during reinforcement cage installation and concrete placement operations in the shaft excavation.

D. The access tubes shall be filled with potable water as soon as possible after concrete placement (but no later than one day after concrete placement), and the top watertight threaded PVC caps shall be reinstalled.

6-19.3(7) PLACING CONCRETE

A. Concrete placement shall commence immediately after completion of excavation by the Contractor and inspection by the Project Engineer. Immediately prior to commencing concrete placement, the shaft excavation and the properties of the slurry (if used) shall conform to subsections 6-19.3(3)F and 6-19.3(4), respectively, of this Special Provision. Concrete placement shall continue in one operation to the top of the shaft, or as shown in the Plans. The Contractor shall place concrete between the upper construction joint of the shaft and the top of the shaft in the dry.

B. When placing concrete in the dry, only the top five feet of concrete shall be vibrated. If a temporary casing is used it shall be removed before vibration. This requirement may be waived if a temporary casing is used and removed with a vibratory hammer during the concrete placement operation. Vibration of concrete does not affect the maximum slump allowed for the concrete class specified.

C. If water is not present, the concrete shall be deposited through the center of the reinforcement cage by a method which prevents segregation of aggregates and splashing of concrete on the reinforcement cage. The concrete shall be placed such that the free-fall is vertical down the center of the shaft without hitting the sides, the steel reinforcing bars, or the steel reinforcing bar cage bracing.

D. When placing concrete underwater, including when water in a shaft excavation exceeds three inches in depth with an infiltration rate of 12 inches of depth or more in one hour, the Contractor shall place the concrete by pressure feed using a concrete pump, with a watertight tube having a minimum diameter of 4 inches. The discharge end of the tube

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on the concrete pump shall include a device to seal out water while the tube is first filled with concrete. Concrete placement by gravity feed is not allowed.

E. Throughout the underwater concrete placement operation, the discharge end of the tube shall remain submerged in the concrete at least 5 feet and the tube shall always contain enough concrete to prevent water from entering. The concrete placement shall be continuous until the work is completed, resulting in a seamless, uniform shaft. If the concrete placement operation is interrupted, the Project Engineer may require the Contractor to prove by core drilling or other tests that the shaft contains no voids or horizontal joints. If testing reveals voids or joints, the Contractor shall repair them or replace the shaft at no expense to the Contracting Agency. Responsibility for coring costs, and calculation of time extension, shall be in accordance with subsection 6-19.3(9)H of this Special Provision.

F. Before placing any fresh concrete against concrete deposited in water or slurry, the Contractor shall remove all scum, laitance, loose gravel and sediment on the upper surface of the concrete deposited in water or slurry and chip off any high spots on the upper surface of the existing concrete that would prevent the steel reinforcing bar cage from being placed in the position required by the Plans.

Prior to performing any of the crosshole sonic log testing operations specified in subsection 6-19.3(9) of this Special Provision, the Contractor shall remove the concrete at the top of the shaft down to sound concrete.

G. The Contractor's construction operation in the vicinity of a drilled shaft excavation with freshly placed concrete and curing concrete shall conform to Section 6-02.3(6)D.

H. Except for shafts where the shaft concrete is placed in the dry, the Contractor shall complete a uniform yield form, consistent with the sample form submitted to the Project Engineer as part of the shaft installation plan as specified in subsection 6-19.3(2)B.9 of this Special Provision, for each shaft and shall submit the completed form to the Project Engineer within 24 hours of completing the concrete placement in the shaft.

6-19.3(8) CASING REMOVAL

A. As the temporary casing is withdrawn, a minimum 5 foot head of concrete shall be maintained to balance the foundation material and water pressure at the bottom of the casing but shall not exceed the height that causes concrete to lose its fluidity as determined by the Project Engineer.

B. Tops of permanent casings for the shafts shall be removed to the top of the shaft or finished ground line, whichever is lower, unless directed otherwise by the Project Engineer. For those shafts constructed within a permanent body of water, tops of permanent casings for shafts shall be removed to the low water elevation, unless directed otherwise by the Project Engineer.

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C. The Contractor shall completely remove all temporary casings, except as noted. The Contractor may leave some or all of the temporary casing in place provided all the following conditions are satisfied:

1. The Contractor shall submit the following information in writing to the Project Engineer:

   a. The Contractor shall completely describe the portion of the temporary casing to remain.

   b. The Contractor shall specify the reason(s) for leaving the portion of the temporary casing in place.

   c. The Contractor shall submit structural calculations, using the design specifications and design criteria specified in the General Notes of the structure Plans, in accordance with Section 6-01.9, indicating that leaving the temporary casing in place is compatible with the structure as designed in the Plans.

2. The Contractor shall have received the Project Engineer's written approval of the submitted request to leave the temporary casing in place.

6-19.3(9) NONDESTRUCTIVE TESTING OF SHAFTS (CROSSHOLE SONIC LOG TESTING)

A. The Contracting Agency will perform crosshole sonic log testing and analysis on all completed shafts designated for testing by the Project Engineer. The Contracting Agency will require advance notice from the Contractor to schedule all crosshole sonic log testing. The Contractor shall give at least 48 hours notice to the Project Engineer of the time the concrete in each shaft will be sufficiently cured to allow for crosshole sonic log testing.

The testing will be performed after the shaft concrete has cured at least 96 hours. Additional curing time prior to testing may be required if the shaft concrete contains admixtures, such as set retarding admixture or water reducing admixture, added in accordance with Section 6-02.3(3). The additional curing time prior to testing required under these circumstances shall not be grounds for additional compensation or extension of time to the Contractor in accordance with Section 1-08.8.

Crosshole sonic log testing will be conducted at all shafts in which access tubes for test probe access have been installed (see subsection 6-19.3(6)A of this Special Provision).

B. After placing the shaft concrete and before beginning the crosshole sonic log testing of a shaft, the Contractor shall inspect the access tubes. Each access tube that the test probe cannot pass through shall be replaced, at the Contractor's expense, with a two inch diameter hole cored through the concrete for the entire length of the shaft. Unless directed otherwise by the Project Engineer, cored holes shall be located approximately six inches inside the reinforcement and shall not damage the shaft reinforcement.

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Descriptions of inclusions and voids in cored holes shall be logged and a copy of the log shall be submitted to the Project Engineer. Findings from cored holes shall be preserved, identified as to location, and made available for inspection by the Project Engineer.

C. The Project Engineer will determine final acceptance of each shaft, based on the crosshole sonic log test results and analysis for the tested shafts, and will provide a response to the Contractor within three working days after receiving the test results and analysis submittal.

D. Except as otherwise noted, the Contractor shall not commence subsequent shaft excavations until receiving the Project Engineer's approval and acceptance of the first shaft, based on the results and analysis of the crosshole sonic log testing for the first shaft. The Contractor may commence subsequent shaft excavations prior to receiving the Project Engineer's approval and acceptance of the first shaft, provided the following condition is satisfied:

1. The Project Engineer approves continuing with shaft construction based on the Project Engineer's observations of the construction of the first shaft, including, but not limited to, conformance to the shaft installation plan as approved by the Project Engineer, and the Project Engineer's review of Contractor's daily reports and Inspector's daily logs concerning excavation, steel reinforcing bar placement, and concrete placement.

E. If the Contractor requests, the Project Engineer may direct that additional testing be performed at a shaft. If subsequent testing at a shaft indicates the presence of a defect(s) in the shaft, the testing costs and the delay costs resulting from the additional testing shall be borne by the Contractor in accordance with Section 1-05.6. If this additional testing indicates that the shaft has no defect, the testing costs and the delay costs resulting from the additional testing will be paid by the Contracting Agency in accordance with Section 1-05.6, and, if the shaft construction is on the critical path of the Contractor's schedule, a time extension equal to the delay created by the additional testing will be granted in accordance with Section 1-08.8.

F. For all shafts determined to be unacceptable, the Contractor shall submit a plan for further investigation or remedial action to the Project Engineer for approval. All modifications to the dimensions of the shafts, as shown in the Plans, required by the investigation and remedial action plan shall be supported by calculations and working drawings as specified in Section 6-01.9. All investigation and remedial correction procedures and designs shall be submitted to the Project Engineer for approval. The Contractor shall not begin repair operations until receiving the Project Engineer's approval of the investigation and remedial action plan.

G. If the Project Engineer determines that the concrete placed under slurry for a given shaft is structurally inadequate, that shaft will be rejected. The placement of concrete under slurry shall be suspended until the Contractor submits to the Project Engineer written

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changes to the methods of shaft construction needed to prevent future structurally inadequate shafts, and receives the Project Engineer's written approval of the submittal.

H. At the Project Engineer's request, the Contractor shall drill a corehole in any questionable quality shaft (as determined from crosshole sonic log testing and analysis or by observation of the Project Engineer) to explore the shaft condition.

Prior to beginning coring, the Contractor shall submit the method and equipment used to drill and remove cores from shaft concrete to the Project Engineer and receives the Project Engineer's written approval. The coring method and equipment shall provide for complete core recovery and shall minimize abrasion and erosion of the core.

If a defect is confirmed, the Contractor shall pay for all coring costs in accordance with Section 1-05.6. If no defect is encountered, the Contracting Agency will pay for all coring costs in accordance with Section 1-05.6, and, if the shaft construction is on the critical path of the Contractor's schedule, compensation for the delay will be granted by an appropriate time extension in accordance with Section 1-08.8. Materials and Work necessary, including engineering analysis and redesign, to effect corrections for shaft defects shall be furnished to the Project Engineer's satisfaction at no additional cost to the Contracting Agency.

I. All access tubes and cored holes shall be dewatered and filled with grout after tests are completed. The access tubes and cored holes shall be filled using grout tubes that extend to the bottom of the tube or hole or into the grout already placed.

6.19.4 MEASUREMENT

A. Measurement will be made as follows:

1. Soil excavation for shaft including haul will be measured by the cubic yards of shaft excavated. The cubic yards will be computed using the shaft diameter shown in the Plans, the top of shaft soil excavation, as defined below, and the bottom elevation shown in the Plans, unless adjusted by the Project Engineer,

   Except as otherwise specified, the top of shaft soil excavation shall be defined as the highest existing ground point within the shaft diameter and shall not be above the top of the shaft as shown in the Plans. For shafts where the top of shaft is above the existing ground line and where the Plans show embankment fill placed above the existing ground line to the top of shaft and above, the top of shaft soil excavation shall be defined as the top of shaft. Excavation through embankment fill placed above the top of shaft will not be included in the measurement.

2. Furnishing and placing temporary casing will be measured by the number of linear feet of required temporary casing, as specified in subsection 6-19.3(3)B of this Special Provision, installed within the limits shown in the Plans, plus additional length approved by the Project Engineer for temporary casing required to address field conditions as encountered.

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3. Casing shoring will be measured by the number of linear feet of casing shoring installed. The linear feet dimension will be computed using either the top of ground line, defined as the highest ground line elevation within the casing shoring, or the specified shaft seal vent elevation as shown in the Plans, whichever is higher, and the bottom elevation as shown in the Plans.

4. Concrete Class 4000P for shaft will be measured by the cubic yards of concrete in place. The cubic yards will be computed using the shaft diameter shown in the Plans, and the top and bottom elevations shown in the Plans, unless adjusted by the Project Engineer.

5. Steel reinforcing bar for shaft will be measured by the computed weight of all reinforcing steel in place, as shown in the Plans. Bracing for steel reinforcing bar cages shall be considered included in this item of Work.

6. CSL access tube will be measured by the linear foot of tube furnished and installed.

7. Shoring Or Extra Excavation Cl. A - _____ will not be measured but will be paid for on a lump sum basis as described in Section 6-19.5.

8. Shafts associated with the “Art Features” as depicted on the “AF” sheets of the Plans will not be measured but will be paid for on a lump sum basis to include all Work items as described in 8-28.4 and 8-28.5.

6.19.5 PAYMENT

A. Payment will be made, for shafts associated with the approach piers and abutments, in accordance with Section 1-04.1, for the following bid items when they are included in the proposal:

1. "Soil Excavation for _____ Diam. Shaft Incl. Haul", per cubic yard, including all costs in connection with furnishing, mixing, placing, maintaining, containing, collecting, and disposing of all mineral, synthetic, and water slurry.

2. "Furnishing & Placing Temp. Casing for ____ Dia. Shaft", per linear foot, including all costs in connection with completely removing the casing after completing shaft construction.

3. “Casing Shoring”, per linear foot, including all costs in connection with placing seals when required.

4. "Shoring Or Extra Excavation Cl. A - _____ lump sum, including all costs in connection with all excavation outside the limits specified for items 1 and 2, all temporary telescoping casings, and all optional temporary casings.

5. "Conc. Class 4000P for _____ Diam. Shaft", per cubic yard.

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6. "St. Reinf. Bar For _____ Diam. Shaft", per pound, including all costs in connection with furnishing and installing steel reinforcing bar spacers and centralizers.

7. "CSL Access Tube for _____ Diam. Shaft", per linear foot.

8. "Removing Shaft Obstructions", estimated.

No measurement or payment will be made for slurry. All costs in connection with slurry shall be included in related bid items. Payment for all shafts associated with "Art Features" as depicted in the "AF" sheets of the Plans will be made as described in 8-24.5.

B. Payment for Removing Shaft Obstructions

1. Payment for removing, breaking-up, or pushing aside, shaft obstructions, as defined in subsection 6-19.3(3)H of this Special Provision, will be made for the changes in shaft construction methods necessary to deal with the obstruction. The Contractor and the Project Engineer shall evaluate the effort made and reach agreement on the equipment and employees utilized, and the number of hours involved for each. Once these cost items and their duration have been agreed upon, the payment amount will be determined using the rate and markup methods specified in Section 1-09.6. For the purpose of providing a common proposal for all bidders, the Contracting Agency has entered an amount for the item "Removing Shaft Obstructions" in the bid proposal to become a part of the total bid by the Contractor.

2. If shaft construction equipment is idled as a result of the work required to deal with the obstruction and cannot be reasonably reassigned within the project, then standby payment for the idled equipment will be added to the payment calculations. If labor is idled as a result of the work required to deal with the obstruction and cannot be reasonably reassigned within the project, than all labor costs resulting from Contractor labor agreements and established Contractor policies will be added to the payment calculations.

3. The Contractor shall perform the amount of obstruction work estimated by the Contracting Agency within the original time of the Contract. The Project Engineer will consider a time adjustment and additional compensation for costs related to the extended duration of the shaft construction operations, provided:

   a. The dollar amount estimated by the Contracting Agency has been exceeded, and

   b. The Contractor shows that the obstruction removal work represents a delay to the completion of the project based on the current progress schedule provided in accordance with Section 1-08.3.

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6-20 SUPERSTRUCTURE - BASCULE SPAN (NEW SECTION)

6-20.1 DESCRIPTION

This Work includes the movable bascule span leafs, complete, in place and operable as indicated in the Contract Documents to the satisfaction of the Project Engineer. This item includes: shop drawing preparation and submittal, fabrication, testing, storage, handling, transportation, erection, furnishing, and painting, of components including, but not limited to, bascule girders, floorbeams, cantilever brackets, bolted splices, lateral bracing, gusset plates, shear studs, vehicular deck grating, sidewalk deck grating, roadway joints, sidewalk joints, bascule span-supported maintenance walkways, as well as all necessary connections and fasteners; Class 4000LW Concrete (lightweight concrete) for the bascule span roadway and sidewalks; Class 4000HW (heavyweight concrete) for the counterweight; balance blocks and plates; and miscellaneous items related to those described.

This item also includes the trunnion frames supporting the bascule leaves within Bascule Piers 3 and 4, complete, in place, and serviceable as indicated in the Contract Documents to the satisfaction of the Project Engineer. This item includes: shop drawing preparation and submittal, fabrication, testing, storage, handling, transportation, erection, furnishing, and painting of components including, but not limited to, columns, beams, plates, anchor bolt assemblies, machine floor slab concrete and reinforcing steel, and miscellaneous items related to those described.

This item also includes the fixed spans over the counterweight at Bascule Piers 3 and 4, complete, in place, and serviceable as indicated in the Contract Documents to the satisfaction of the Project Engineer. This item includes: shop drawing preparation and submittal, fabrication, testing, storage, handling, transportation, erection, furnishing, and painting (where applicable), of components including, but not limited to, floorbeams, overhang brackets, cross frames, diaphragms, roadway deck slab, roadway joint at bascule span, and elastomeric bearing pads with associated hardware, including shear blocks, anchor bolt assemblies.

The traffic barriers and pedestrian railings supported by the bascule leaves and spans over the counterweight will be measured and paid for under pay items separate from “Superstructure – Bascule Span”.

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6-20.2 MATERIALS

Materials shall meet the requirements of the following Sections:

Class 4000HW Concrete	6-02.3(6)F
Class 4000LW Concrete	6-02.3(6)G
Sheet Curing Materials	9-23.1
Structural Steel and Related Materials	9-06
Fiber-Reinforced Polymer	6-23

Unless otherwise noted on the Contract Plans, all structural steel shall be Structural Low Alloy Steel. Bascule girder webs and live load shoe columns within the limits shown on the Contract Plans shall be Structural High Strength Steel. Structural Carbon Steel is permissible only where noted on the Contract Plans.

6-20.3 Construction Requirements

Construction of concrete structures shall conform to Section 6-02. Furnishing, fabricating, and erecting of steel structures shall conform to Section 6-03. Cleaning and painting of steel structures shall conform to 6-07.

Welded shear studs shall be welded with automatic timed welding equipment, in accordance with ANSI/AASHTO/AWS D1.5.

All bolts shown on the "BL" sheets within the Plans shall be 7/8 inch diameter, unless noted otherwise.

Fillet welds shown on the "BL" sheets within the Plans shall be the minimum size required by ANSI/AASHTO/AWS D1.5, unless noted otherwise.

6-20.3(1) PERMANENT STEEL BRIDGE DECK FORMS

Permanent steel bridge deck forms are not permitted on the bascule span or the fixed span over the counterweight.

6-20.3(2) COUNTERWEIGHTS

Each counterweight is a steel box between the bascule girders, as detailed on the Contract Plans, filled with Class 4000HW Concrete (heavyweight concrete). The counterweight with pockets provided therein for balance blocks for securing an initial balance of each bascule leaf and future balance adjustment. For future adjustment of the counterweights, the Contractor shall provide additional balance blocks over and above those required for the initial balance as indicated on the Contract Plans. These blocks shall be stored at the site at locations designated by the Project Engineer.

6-20.3(3) BASCULE SPAN CONSTRUCTION

Special attention is called to the necessity for the correct alignment of the forward (toe) and rear (heel) joint details. The bascule girders and floorbeams shall be cambered for dead load as specified on the Contract Plans. Each bascule leaf shall be assembled as a unit in the shop in its cambered position. Proper alignment of machinery bearings or other casings shall be verified.

The setting of all members and other parts, which serve as supports or connections of the movable parts or machinery, shall be set to the tolerances described within the Contract Documents. In no case shall concrete be placed around such parts before they are firmly held in place by proper temporary bracing and before the accuracy of the setting has been checked. Prior to the setting of critical members, the Contractor shall submit an erection procedure to the

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Project Engineer for review and approval. This erection procedure shall show estimated displacements and deflections of steel work while portions of the structure are erected and concrete placed.

The Contractor shall monitor the deflection of the bascule girders during placement of concrete on the roadway and sidewalks decks.

6-20.3(4) FABRICATION

The flange plates, which support the trunnion bearings, shall be so accurately welded to the web plates that not less than the designated thickness of metal will remain after finishing. Flange plates shall be square with the web. These plates shall be ordered with extra thickness to allow for finishing and tolerances. The flange plates shall be planed throughout the length as shown on the Contract Plans to provide a true plane for attaching the trunnion bearings.

Special attention is called to the alignment of trunnions. See Division 10 for additional requirements.

Stainless Steel Shims: Wherever shims are required, the nominal, or theoretical, thickness "t" shall be indicated. The actual shim pack furnished shall have a thickness equal to 2 times the nominal thickness indicated and shall be composed of the following material thickness: t, t/2, t/4, t/8, t/16, and etcetera. The thickness of the material furnished shall be such that the total shim pack thickness can be adjusted in increments of $1/32^{nd}$ inch for machinery bases and structural parts that have machined surfaces, or $1/16^{th}$ inch for structural steel connections for parts not having machined surfaces.

6-20.3(5) BASCULE SPAN ERECTION

The Contractor will be allowed to close the navigation channel to marine traffic for a total of eight (8) calendar days for purposes of erecting the bascule span. The maximum number of consecutive calendars days the Contractor will be allowed to close the navigation channel to marine traffic will be limited to four (4).

During periods when the bascule leaves are unbalanced, the Contractor must provide positive, sturdy supports, shoring, and /or falsework to support the unbalanced loads. The Contractor shall secure the services of a Professional Engineer, licensed in the State of Washington, to design these supports to the entire unbalanced loads plus all additional loads resulting from wind forces, temporary erection forces, accumulations of snow, ice or dirt, etcetera. The Contractor shall submit proposed shoring methods, sealed by the Contractor's engineer, to the Project Engineer for review and approval. It will remain the Contractor's responsibility to ensure that the bascule leaves are adequately shored in a safe manner.

The Contractor shall submit erection procedures of proposed stages of construction, means of control, and motive power to the Project Engineer for review and approval. The Contractor shall keep ready at a convenient nearby location sufficient counterweight material to balance the bridge leaves during the erection and completion. It will remain the Contractor's responsibility to assure that the bascule leaves are opened and lowered in a safe manner.

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The Contractor shall verify clearances. The first time the bascule leaf is slowly moved; a check shall be made of all points of minimal clearance or possible interference between the fixed and movable parts of the structure or as otherwise specified on the Contract Plans. Particular care must be taken to ensure that the joints in the roadway deck are adjusted for smooth joints, proper alignments and clearances.

Metal Work Set in Concrete: All metal work set in concrete shall be placed and maintained with care in exact alignment at the proper elevation. Where a grout bed is required, the metal parts shall be adjusted and supported by means of leveling bolts. The grout bed shall be made with an approved self-leveling, high strength, non-shrink and non-staining grout. All metal work shall be adjusted to the satisfaction of the Project Engineer before being set in concrete or mortar.

6-20.3(6) PLACING SPAN IN OPERATION CONDITION

The span shall be placed in an operating condition, to the satisfaction of the Project Engineer, upon its final completion. The span shall be operated sufficiently to enable the Project Engineer to inspect its operation to their satisfaction. Faulty and defective work shall be repaired or replaced at no additional cost to the County.

Operating Machinery Work: The furnishing, fabricating, installing and/or erecting, painting, adjusting, and the placing in operation of all related items shall be as specified in the Division 10 Operating Machinery.

6-20.3(7) SPAN BALANCING

This Work shall consist of the Contractor developing calculations and testing the operation of the bascule span to ensure its balance.

During the shop drawing development, the Contractor shall submit complete and thorough center-of-gravity calculations for the bascule span in a tabulated form showing each component's weight, the distance to each component's center of gravity horizontally and vertically (and transversely, where not symmetric with respect to the bridge centerline), the product of each component's weight and distances (moments), the net summation of component weights and moments, and mean center-of-gravity location. This tabulation shall be developed for each bascule leaf in the fully lowered and fully open positions, each counterweight in the fully lowered and fully open positions, and the complete structure, which is the combination of both.

Calculation Procedures:

Center-of-gravity calculations shall be obtained by using weights from approved shop drawings for the structural steel, pedestrian railing, traffic barrier, roadway deck grating, sidewalk deck grating and all joints, as well as Class 4000LW and Class 4000HW concrete test block results, estimated weight of paint on the structural steel, and incidentals such as navigation lighting, conduits, wiring, span locks, platforms, bird control hardware, etcetera.

Counterweight calculations shall be based on the assumption that half of the balance blocks (approximately 4 percent of counterweight weight) are in place at the counterweight in the fully balanced condition, or as directed by the Project Engineer.

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Weights for structural steel shall be computed on the basis of the net finished parts as shown on the shop drawings deducting for cope, cuts, clips and all open holes. Weights of bolts, nuts, washers and welds shall be included.

The Contractor shall compute the weights in pounds of individual components, reported to two decimal places and summarized to the nearest whole number. Calculations shall be furnished showing the development of these weights.

The center of gravity of each component shall be located horizontally and vertically, with respect to the centerline of trunnion, in the fully open and fully lowered positions. Where necessary, the center of gravity of each component shall be located transversely with respect to the bridge centerline. All dimensions shall be reported in feet and to two decimal places. Positive (+) distances will be for elements forward and above the centerline of trunnion, while negative (-) distances will be for elements having centers of gravity behind or below the centerline of trunnion. Positive (+) and negative (-) assignment of transverse distances, where necessary, shall be consistent throughout the balance calculations.

These calculations shall be utilized by the Contractor in developing the required information for the counterweight calculations, which are further explained in Section 6-02.3(6)F, Class 4000HW Concrete.

No construction shall proceed on the counterweight until the balance calculations have been reviewed and approved by the Project Engineer. The balance calculations shall be prepared, signed and sealed by a Professional Engineer licensed to practice in the State of Washington and familiar with movable bridges.

Balance calculations shall be prepared and balance adjustments performed such that, in the calculations, the bascule span is nearly balanced. It is desired to have a slight unbalanced condition, which is specified in subsequent section, for which adjustment shall be made in the field.

Throughout the entire construction, the Contractor shall maintain a copy of the balance tabulation on site and correct the calculations to reflect any adjustments required for field installation of the components.

Balancing Procedures (perform on each leaf individually)

After the concrete counterweight, steel grid deck, sidewalks and curbs, railings and barriers are constructed and the counterweight adjusted for the predetermined balance by installing some of the balance blocks, the Contractor shall take a preliminary balance reading of the bascule span. This preliminary reading shall be performed by jacking the span using pressure readings from hydraulic jacks placed under the live load shoe. No extraneous loads shall be on the span during the jacking. The Contractor shall place a hydraulic jack under each live load bearing shoe and apply sufficient load to unseat the span from its bearings. Pressure readings at each jack shall be taken to determine the unbalanced moments. The Contractor shall also place hydraulic jacks under each bascule girder at the counterweight and apply sufficient load to close the span. Pressure readings at each jack shall be taken to determine the unbalanced moments. These

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pressure readings shall also be used to estimate the trunnion friction. An unbalanced moment no greater than 400 kip-ft in the direction towards the channel (span heavy) will be considered suitable. If a greater moment exists, the Contractor shall rebalance and re-jack the span until this moment is attained. At no time will a moment in the direction of the counterweight (tail heavy) be acceptable. The Contractor shall repeat this procedure until the unbalanced moment is acceptable.

Once this initial balancing has been performed, the Contractor shall operate the bascule span utilizing the operating machinery system. The operation of the span shall occur with no extraneous loads on the span and when the weather and wind conditions impose no additional loading on the span.

After the balance blocks have been placed, a second test operation will be run and recorded as previously mentioned. If the operation indicates a need to further refine the balance, the Contractor shall make the adjustments in placement of balance blocks. This procedure shall be repeated until the desired span balance is obtained.

The Contractor may submit for review and approval an alternate method of span balance. Rejection of alternate method shall at no time be considered extra cost to the County.

Balance Testing Procedures (perform on each leaf individually)

The Contractor shall develop and submit to the Project Engineer a testing and certification plan for all aspects of the span balancing. The span balancing testing and certification plan shall systematically check the requirements of the span balancing to verify the bascule spans are balanced and in conformance with the Contract requirements. The Contractor shall submit the testing and certification plan to the Project Engineer for review and approval. The Contractor shall develop and utilize Project Engineer approved testing and certification forms to provide objective evidence of successfully testing the span balancing. The Contractor shall successfully complete all testing of the span balancing independent of the Project Engineer and submitted signed certification forms attesting to the successful testing and balanced condition of the bascule spans to the Project Engineer.

Once the Contractor has successfully tested the balance of the bascule spans and submitted the corresponding certification forms, the Contractor shall again test the balance of the bascule spans for validation purposes in the presence of the Project Engineer and representatives of the bridge designer to demonstrate the bascule spans are balanced and meet the Contract requirements. If the initial validation testing in the presence of the Project Engineer and the designer's representatives is unsuccessful and cannot be remedied and successfully re-tested with 24 hours, the Contractor shall reschedule subsequent testing and shall reimburse the County for the direct cost associated with re-mobilizing and participation in each subsequent validation testing events by the bridge designer's representatives at a cost of up to $12,500 each subsequent span balancing validation testing event.

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6-20.3(8) PAINTING

Paint all structural steel in accordance with Section 6-07

6-20.4 MEASUREMENT

"Superstructure – Bascule Span" will not be measured but will be paid for on a lump sum basis as described in 6-20.5.

The "Superstructure - Bascule Span" contains the following approximate quantities of materials and Completed Work:

Item	Approx. Quant.	Unit
Structural Low Alloy Steel	2,969,616	LBS.
Structural High Strength Steel	393,041	LBS.
Welded Shear Connectors	8,796	Each
Elastomeric Bearing Pads	20	Each
Roadway Deck (Partially Filled Grating)	13,500	S.F.
Sidewalk Deck (Filled Grating)	2,340	S.F.
Cost Iron Balance Blocks	2,548	Each
Conc. Class 4000LW	214	C.Y.
Conc. Class 4000HW	612	C.Y.
Conc. Class 4000D	174	C.Y.
Epoxy-Coated St. Reinf. Bar	27,382	LBS.
St. Reinf. Bar	49,618	LBS.
Bascule Rear (Heel) Roadway Joint	108	L.F.
Bascule Rear (Heel) Sidewalk Joint	24	L.F.
Bascule Rear (Heel) Longitudinal Joint	110	L.F.
Bascule Forward (Toe) Roadway Joint	108	L.F.
Bascule Forward (Toe) Sidewalk Joint	24	L.F.
Expansion Joint	108	L.F.
FRP Maintenance Walkway	968	S.F.

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Anchor Bolt Assemblies	168	EA.
Bird Control	1	L.S.
Cleaning and Painting – Bascule Superstructure	1	L.S.
Testing	1	L.S.

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

Item does not include: Machinery required for complete operation of the span, spider plates at trunnion connection to bascule girder, span locks, traffic barrier, pedestrian railing, joint between approach span and counterweight span, navigation lights, conduits, and wiring.

6-20.5 PAYMENT

Payment will be made in accordance with Section 1-04.1, for each of the following:

"Superstructure - Bascule Span", per lump sum.

The lump sum Contract price for "Superstructure - Bascule Span" shall be full pay for all costs in completely furnishing and installing items as shown and noted in the Contract Plans as well as outlined in these provisions and the Standard Specifications.

6-21 FENDER SYSTEM (NEW SECTION)

6-21.1 DESCRIPTION

This Work consists of furnishing 24-inch diameter steel piling, steel pile tips or shoes, structural carbon steel, stainless steel plates and rods, plastic lumber, driving steel piles, fiberglass reinforced polymer (FRP) grating, and fabricating, and constructing the bridge fender system. Fender system shall be constructed in 2 stages:

Easterly – constructed after the existing bridge is removed

Westerly – construct prior to opening proposed bridge

The bridge fender systems serve primarily as navigation aids to vessel traffic by delineating the shipping channel beneath bridges.

6-21.1(1) SUBMITTALS

The Contractor shall obtain from the manufacturer one (1) copy each of his standard and most recent product brochure, technical data, and owners field guide for the product covered by this specification. Copies of material test reports and performance test data which support

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compliance with this Special Provision requirements shall be submitted to the County as required by the Contract.

6-21.1(2) SHOP DRAWINGS

The Contractor is responsible for preparing his own shop drawings. Where tolerances prescribed may cumulatively result in incorrect fits, the Contractor shall provide tolerances within those prescribed herein to insure correct fit, assembly, and operations of the items. No deviation from the prescribed dimensions or tolerances is permissible without prior approval of the County.

6-21.2 MATERIALS

Materials shall meet the requirements of the following Sections:

Structural Plastic Lumber	9-36
Steel Pile Tips and Shoes	9-10.4
Steel Piling	9-10.5
Stainless Steel	ASTM A240 TYPE 361
FRP Grating	6-23.2 Table 1

6-21.3 CONSTRUCTION REQUIREMENTS

The Contractor shall not install fender system piling within 50 feet of the existing bridge, while the existing bridge is in service until 8 working days prior to opening the proposed bridge to vehicular traffic. The Contractor shall not install fender system piling more than 42 feet right of the centerline of the proposed bridge until such time as the existing bridge is closed to vehicular traffic.

6-21.3(1) PLASTIC LUMBER INSTALLATION

Installation shall be in accordance with manufacturer's guidelines as noted in the owners field guide.

Protect materials at all times against exposure to extreme heat or impact. Transport Structural Plastic Lumber in a manner that will minimize scratching or damage to the outer surfaces, stack on dunnage above ground so that it may be easily inspected, and store in a manner that will avoid damage. Handle and lift Structural Plastic Lumber with nylon slings. Do not use sharp instruments in handling the product. Structural Plastic Lumber damaged in shipping or handling will be rejected.

Structural Plastic Lumber sections containing cracks in the reinforcing rods or cracks, partial or full depth, across the section or splits will be rejected.

Cut, bevel, drill, countersink and otherwise install Structural Plastic Lumber in accordance with the manufacturer’s recommendations. Set all material accurately to required levels and lines, with members plumb and true and accurately cut and fitted. Securely attach all materials to

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substrate by anchoring and fastening as shown on the Plans. Perform all cutting and drilling in a manner that allows for the collection of all debris and dispose of properly.

6-21.3(2) PILING AND STEEL STRUCTURE INSTALLATIONS

Install piles in accordance with Section 6-05. After driving, cut off piles to the exact plane of the fender system above them as shown in the Plans by means as approved by the Project Engineer to provide a smooth level cut.

Furnishing, fabricating, and installing the structural steel components for the fender system as shown in the Plans shall be in compliance with Section and 6-03.

All structural steel pipe piles, rolled steel sections, shapes, channels, and structural steel members shall be galvanized in accordance with ASSHTO M111. All structural bolts, except headed stainless steel rods, shall be AASHTO M164 (ASTM A325) Type 1 high strength bolts only and shall be hot-dip galvanized to AASHTO 232, unless otherwise noted in the Plans.

6-21.3(3) FRP GRATING INSTALLATIONS

Construction, fabrication and installation of the FRP grating walkway shall be performed in accordance with the manufacturer's instructions. Maximum dimensional tolerances of the FRP grating shall be within tolerances specified in published material provided by the manufacturer. The installation of FRP grating shall be in accordance with Section 6-23.3.

6-21.4 MEASUREMENT

Measurement for "Furnishing St. Piling" shall be in accordance with Section 6-05.4.

Measurement for "Driving St. Pile" shall be in accordance with Section 6-05.4.

Measurement for "Furnishing Steel Pile Tip or Shoe (size)" shall be in accordance with Section 6-05.4.

Measurement for "Structural Carbon Steel" shall be in accordance with Section 6-03.4.

"Stainless Steel for Fender" shown in the Plans will be measured by the pound or will be paid for on a lump sum basis, whichever is shown on the Proposal.

Measurement for "Structural Plastic Lumber" will be measured by the 1,000-board feet (MBM), using nominal thicknesses and widths. Lengths will be actual lengths of individual pieces in the finished Structure with no deduction for daps, cuts, or splices.

Measurement for "FRP Grating" will be square feet of walkway surface and shall include the complete execution of Work described and as shown in the Plans.

6-21.5 PAYMENT

Payment will be made in accordance with Section 1-04.1, for each of the following Bid items that are included in the Proposal:

1. "Furnishing St. Piling" will be made in accordance with Section 6-05.5.

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2. "Driving St. Pile" will be made in accordance with Section 6-05.5.

3. "Furnishing Steel Pile Tip or Shoe" will be made in accordance with Section 6-05.5.

4. "Structural Carbon Steel" will be made in accordance with Section 6-03.5.

5. "Stainless Steel for Fender" will be made on the same per pound basis as specified for structural carbon steel.

6. "Structural Plastic Lumber" will be made on the same per MBM as specified for timber and lumber.

7. "FRP Grating", per square foot. The Contract price for "FRP Grating" shall be full compensation for all costs in connection with furnishing all materials, labor, tools, and equipment necessary for the manufacture, fabrication, transportation, erection, and incidentals necessary to complete the Work.

All costs in connection with completing the Work, including furnishing and installing steel piles, steel pile tip or shoe, structural carbon steel, stainless steel, structural plastic lumber, and items as shown and noted in the Plans and as outlined in these specifications and in the Standard Specification shall be included in the unit Contract prices for the pay items involved and shown.

6-22 BASCULE PIER CAISSONS (NEW SECTION)

6-22.1 DESCRIPTION

Bascule piers 3 and 4 shall be constructed on foundations consisting of dredged caissons sunk by dredging to the depths indicated on the Contract Plans or to such other depths as the Project Engineer may consider necessary as the Work progresses.

The term caisson designates a permanent part of the foundation so constructed as to sink gradually into place as material is excavated from within and below the cutting shoe from caisson dredge wells. After caissons have been sunk to required depths and are in approved positions, sealing courses of concrete shall be deposited under water. All dredge wells above such sealing courses of concrete shall be filled with only potable water prior to sealing the dredge wells with the caisson cap.

The Contractor shall make his own appraisal of the difficulties of sinking the caissons through any and all materials to the final founding elevation and shall determine the means and methods of construction required for satisfactory sinking at all stages of construction and shall be prepared to sink the caissons through all soils and obstructions encountered. The bidders and Contractor are advised that soil samples were collected from portions of the FB-X borings depicted on the "SB" sheets of the Contract Plans and will be made available for viewing.

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6-22.1(1) CUTTING SHOE DESIGN

The geometric configuration of the lower 18 feet of the caissons depicted in the Contract Plans and referred to as the Cutting Shoe and/or Cutting Edge is conceptual. The Contractor shall design the geometric configuration, within limitations defined herein, of the cutting shoe to meet the Contractor's proposed means and methods of sinking the caisson. The Contractor designed cutting shoe shall conform to the following requirements.

1. The resulting foot print of the cutting shoe in the final position in combination with the tremie seal, as projected on to a horizontal plane, shall be at least 58 feet by 58 feet square foot area. The 6 inch projection of the caisson cutting edge is shown for information only, actual dimension is Contractor option.

2. The cutting shoe shall be armored with 3/4 inch thick steel plate with 6 inch long by 3/4 inch diameter steel shear studs spaced at a nominal 12 inch square grid pattern.

3. The leading edges of the 3/4 inch thick steel armor plates shall be made continuous by use of bent plates or full penetration welds.

4. The 3/4 inch thick steel armor plates shall extend vertically from the leading edge towards the top of the caisson a minimum of 9 feet.

5. The 3/4 inch thick steel armor plates of the interior dredge wall shall extend vertically from the leading edge towards the top of the caisson a minimum of 3 feet.

6. The cumulative cross sectional area of the vertical steel reinforcement extending from the cutting shoe up into the caisson walls shall not be less than that depicted in the Contract Plans and shall consist of, at a minimum, approximately the same number and same size reinforcement bars on both faces with lap and development lengths to full develop the bars on either side of the cutting shoe to caisson wall interface.

7. The horizontal steel reinforcement within the cutting shoe shall consist of, at a minimum, approximately the same number and same size reinforcement bars with appropriate lap and development lengths to constitute continuous horizontal layers of reinforcement in both the interior and exterior surfaces.

6-22.1(2) CAISSON COFFERDAM DESIGN

The Contractor shall design, provide, install, maintain and remove the caisson cofferdams and all their appurtenances. The Contractor's design of the caisson cofferdams shall include, but not be limited to forces related to water pressure, buoyancy, in-situ soil loads, backfill material loads, superimposed construction loads, water current, wave impact and mooring forces (if any).

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6-22.1(3) WORKING DRAWINGS AND COMPUTATIONS

Before beginning construction operations the Contractor shall submit to the Project Engineer working drawings and computations showing complete design and details of the proposed caisson cofferdams, cutting shoes and methods for construction and geometry control of the caissons. In addition to the hardcopies of the working drawings the Contractor shall submit associated executable computer aided drafting (CAD) files of the working drawings to the Project Engineer. This submittal shall be in the form of a "Caisson Construction Manual".

The Caisson Construction Manual shall be prepared in accordance with the Contractor-adopted general construction techniques and schedule. The Caisson Construction Manual shall provide the design of the caisson cofferdams and cutting shoes and identify proposed construction sequence and methods of construction of, but not limited to: caisson cofferdams, caisson cofferdam backfill material, dewatering methods, dewatering treatment methods, cutting shoes, construction equipment, placement and removal of temporary works (including, spill aprons, walkways, trestles, concrete falsework), methods of excavation, methods of material transportation to and from the caissons, methods of controlling the rate vertical travel of the caissons during sinking operations (including means to increase and decrease vertical rates such as cutting shoe modifications, lubricants and water jetting), methods of stabilizing the caisson cofferdams, methods of controlling geometry of the caissons and the cutting shoes (steering the caissons).

The Caisson Construction Manual shall include the detailed step-by-step procedure for the construction including cofferdams, other temporary works, mooring requirements, material disposal, cutting shoe placement, caisson segment casting, sinking and control of caisson segments, excavation of caisson cofferdam backfill material prior to removal of the caisson cofferdams, removal of the caisson cofferdams, construction of the caisson distribution cap including re-positioning due to misalignment of the caissons, methods used to position the trunnion frame anchorages at the plan specified locations, construction of the first lift of the bascule pier walls, founding of the caisson at the required tip elevation, construction of the submarine cable casing and erection of the trunnion frame. This procedure shall include a table of theoretical elevations and alignment of the caisson geometry control points and cutting shoe during sinking of each caisson segment.

The procedure shall also include the Contractor's proposed methods for measuring, monitoring and recording the elevations and geometry of control points at each stage of caisson construction.

The Caisson Construction Manual shall provide drawings to show the sequence of operations for placement of the caisson cofferdam sheeting, caisson cofferdam excavation and backfill operations, construction of the cutting shoes, construction of the caissons, timing of concrete segment production, dredging, spoil removal, cofferdam removal, placement and removal of Contractor designed falsework, final sinking to plan specified tip elevation, placement of the tremie seal, adjustments to compensate for closure of the caisson distribution cap and placement of the final lift of the caisson distribution cap. The sequence and sinking drawings shall show the caisson displacement under each increment of load, the amount of freeboard on the caisson or bascule pier walls, and the water pressure at critical points for each increment of construction

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and sinking of the caisson. The plan shall include the proposed method of keeping the cutting edge plumb as it comes in contact with and sinking into and within the caisson cofferdam backfill, Glaciamarine Drift and Estuarine Deposits and proposed methods of steering the caisson through unbalanced lateral earth pressures. Acceptable methods may include design features of the cutting shoes, water jetting for removal of soil near the cutting show and lubrication of exterior caisson surfaces. The elevation of the Glaciamarine Drift and Estuarine Deposits depicted the Plans is approximate and based on the borings shown. The Contractor shall make his own determination as to the actual surface locations and means and methods employed to ensure the caisson remains plumb within two orthogonal vertical planes.

The Contractor shall provide the proposed method of excavation of materials and cleanout of the caisson foundation level at the elevations shown on the Plans or to such depth as determined by the Project Engineer. The Contractor shall provide the proposed method of spoil removal, de-watering and spoil disposal.

Concrete shall be cured a minimum of five calendar days using water curing methods unless otherwise approved by the Project Engineer. The Contractor shall make his/her own determination as to the need for concrete admixtures to meet schedule and placement requirements.

The Caisson Construction Manual shall be prepared under the supervision of and sealed by a Professional Engineer licensed in the State of Washington and shall be submitted not less than 60 calendar days in advance of the time the Contractor intends to start work on the caisson cofferdams. The cost of furnishing design computations and drawings shall be included in the Contract and no additional compensation will be allowed the Contractor for any delays resulting from compliance with the above requirements.

The Project Engineer will review the information submitted and notify the Contractor within 30 calendar days of receipt whether the submittal is accepted or additional information is required. Review and comment by the Project Engineer shall in no way relieve the Contractor of the sole responsibility for the means and methods of construction and to construct the Work in accordance with the intent of the Plans and these specifications.

Before beginning construction operations the Contractor shall submit to the Project Engineer falsework submittal in accordance with, but not limited to 2-09.3(3)A, 2-09.3(3)D, 6-01.9 and 6-02. The submittal shall include the design, construction methods and details of:

1. Cutting shoes
2. Caisson Cofferdams including methods of installation and removal,
3. Cantilevered walkways,
4. Caisson distribution cap falsework,
5. Stay-in-place dredge well opening falsework and form work (if used),

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6. Bascule pier wall falsework / formwork.

6-22.2 MATERIALS

Concrete and concrete construction for caissons shall conform to Section 6-02.

All concrete in the caissons except the seal shall be Concrete Class 4000P or Concrete Class 4000MP. Seal concrete shall be Class 4000W.

Epoxy-coated reinforcing steel and reinforcing steel shall conform to Section 9-07.

Steel and steel fabrication for cutting shoes shall conform to Section 6-03. The cutting shoe shall be fabricated of structural carbon steel in accordance with Section 9-06. Painting or galvanizing of structural steel in cutting edges will not be required.

Caisson cofferdam backfill material shall be clean aggregate and/or gravel material free of

The bidders and Contractor's attention is direct to 2-02.3(4) for information related to Contaminated Soils and Hazardous Material and open-water disposal of soils.

6-22.3 CONSTRUCTION REQUIREMENTS

The Contractor may propose alternate caisson concrete lift heights (construction joint locations) to accommodate the means and methods of sinking the caissons. The Contractor may use full contact lapped splices of the vertical reinforcement within the caissons in lieu of the plan specified mechanical splices. The Contractor shall re-detail the caisson vertical reinforcement and design the lap splices and submit the details to the Project Engineer for approval.

6-22.3(1) CAISSON CONSTRUCTION

Reinforced concrete caissons shall be constructed as shown on the Plans or as re-detailed by the Contractor and approved by the Project Engineer. Caissons shall be constructed and handled during positioning and sinking so they maintain correct shape without warping. Methods of constructing caissons and sinking them down to the required tip elevations shall be of the Contractor's selection.

It is anticipated that dredging of the caisson will be performed in various phases of concrete construction. The Contractor shall provide adequate protection for the reinforcing steel exposed in the top of the caisson to prevent damage to the steel. Reinforcing steel damaged due to the Contractor's dredging operation shall be repaired by using approved couplers or drilled and doweled methods approved by the Project Engineer.

Caissons shall be sunk within the following limits of accuracy:

- Transverse to Centerline of Bridge, plus or minus 0.75 foot from plan location.
- Longitudinal, plus or minus 0.75 foot from plan location.
- Rotation about the vertical axis through the intersection of the centerline of bridge and centerline of pier, plus or minus 2.0 degrees from plan location.

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- In no case shall the combined values of transverse, longitudinal and rotational errors be such that any corner of the caisson is more than 1.0 foot from planned longitudinal or transverse location.

The limits of accuracy specified above shall apply to any and all levels of the caisson. In the final positional the caisson cutting shoe shall be founded such that the list measured from the bottom of the cutting edge to the top of the subsequent caisson segment does not exceed 1.5 feet.

To assure location of caissons within the limits specified, special care shall be exercised in sinking the caissons. In preparation for sinking, caissons shall be set on exactly correct horizontal position and shall be maintained at true level. Check measurements for the correctness of position of the caissons shall be made at each increment of sinking. If at any time the caisson has shifted from correct position or correct level, adjustment shall be immediately begun as dredging and sinking is resumed. Caissons shall be sunk by incremental excavation and sinking. Excess excavation permitting large drops of caissons shall be avoided as far as practicable. At no time shall the caisson excavation elevation be lower than the cutting shoe tip elevation by more than 2.0 feet unless it can be shown to the Project Engineer's satisfaction that the additional excavation depth is required to sink the caisson or maintain tolerance limits for location.

The Contractor shall establish satisfactory reference and control marks, telltales, and other checking means; and shall continuous monitor the position, list and cutting edge elevation of each caisson where dredging and sinking operations are in progress. The frequency of making position, list and cutting edge elevation readings shall be as directed by the Project Engineer and shall be performed by the Contractor. The longitudinal and transverse axes of the caissons and well as a horizontal plane baseline shall be scribed on the steel cutting edge. These control lines shall be projected upward on, and scribed into the interior and exterior faces of the caisson segments, together with elevation points, so that all subsequent caisson construction will have its true geometric relation to the plane of the cutting edge.

The Contractor shall furnish satisfactory sounding equipment and operating personnel to check and record dredging depths, dredged widths of the dredge wells, and elevations of materials under cutting edges, heights of water inside of dredge wells, and similar pertinent information for each caisson during dredging operations. Sounding lines shall be suitably mounted on reels for expeditious handling and shall be accurate to within 0.5 feet. These facilities, equipment, and personnel shall be made available at all times to the Project Engineer to assist him in making independent checks on the Work.

Excavated material shall not be deposited against caissons so as to create unbalanced lateral pressures, unless so directed by the Project Engineer.

Care shall be taken during the sinking operations, especially within the caisson cofferdam backfill material and Marsh Deposits, to prevent the "blowing in" or inflow of materials under the cutting edges. Such measures may include the Contractor's design of the cutting shoe, the maintenance of balanced hydrostatic pressures inside and outside the caisson; care to keep

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excavation levels above or near the cutting shoe tip elevations, adjustments to the mass of the caissons, placement intermittent clean timber layers within the cofferdam backfill, placement of intermittent layer of clean load bearing soils within the cofferdam backfill, and restrain from uncontrolled sinking by mechanical means.

Construct submarine cable openings as shown in the Contract Plans.

No excavation shall be made outside of caissons, and the natural stream bed adjacent to the caisson and/or cofferdam shall not be disturbed without the written permission of the Project Engineer. If construction operations should cause settlements of the ground outside the caissons, the Contractor shall, when directed by the Project Engineer, backfill all such excavations or depressions to the original ground surface or stream bed with stone material as specified for riprap.

Upon approval of the depth to which the cutting edge has been driven, the excavation shall be finished to provide uniform and level bearing for placement of the concrete seal against undisturbed soils.

The caissons shall be sunk to the founding elevations as shown on the Plans unless otherwise directed by the Project Engineer. Regardless of the elevation at which the caisson is founded, the bottom and top elevation of the caisson distribution cap shall be as shown on the Plans.

In preparation for placement of the seal concrete, the Contractor shall remove all material below the sloping sides of the exterior wall cutting shoes and below the interior dredge well wall cutting shoes to provide the minimum thickness of seal as shown on the Plans. The Contractor shall provide spud jets, with right angle arms of sufficient length to reach beyond the center of interior walls and beyond the mid-point of all cross wall intersections and such other devices as will be needed to remove all the material under the areas inaccessible to the dredge buckets/clamshells.

Prior to placing the seal concrete, all clay, silt, boulders, or foreign materials shall be removed from the founding bearing surface, including beneath the interior walls and interior walls of the dredging chambers. The surfaces to be in contact with the seal concrete shall be carefully washed and cleaned by means of high pressure jets so designed as to reach all parts of the cutting edges and interior surfaces. As a final cleaning operation, after a rest period sufficient to settle all suspended materials, the Contractor shall carefully remove from the dredging chamber all sludge, clay cuttings, and disturbed founding materials. Air lift methods shall be used to removing this material. The Contractor shall furnish such labor, diver inspection, sounding equipment, right angle pipe feelers and other equipment including imaging and profiling sonar as required enabling the Project Engineer to examine the condition of these surfaces and to inspect final cleaning out of the seal concrete chamber. The caissons shall not be sealed until conditions in the caissons are approved by the Project Engineer.

Final acceptance of the founding surface and seal concrete interface area by the Project Engineer will be based on the requirement that a minimum of ninety percent of the founding bottom

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surface and seal concrete interface area shall be clean and void of all loose soil and foreign materials.

6-22.3(2) CAISSON OBSTRUCTIONS

If obstructions are encountered, the Contractor shall notify the Project Engineer promptly. An obstruction is defined as a specific object (including, but not limited to, boulders, logs, and manmade objects) encountered during caisson sinking operation which prevents or hinders the advance of the caisson sinking. When efforts to advance past the obstruction to the design tip elevation result in the rate of advance of the caisson being significantly reduced relative to the rate of advance for the portion of the shaft excavation in the geological unit that contains the obstruction, then the Contractor shall remove, break-up, or push aside, the obstruction under the provisions of subsection 6-22.5.B of this Special Provision. The method of dealing with such obstructions, and the continuation of excavation shall be as proposed by the Contractor and approved by the Project Engineer.

6-22.3(3) SEAL CONSTRUCTION

The concrete seals shall be constructed in accordance with 6-2.3(6)B and the following:

The Contractor shall be responsible for providing competent seals adequate to permit successful foundation of the caisson on the soils. High quality concrete is imperative and the method shall recognize the necessity of placing the concrete so that it will displace the in-situ water. At no time shall the fresh concrete, during and after placement, be permitted to be mixed with the surrounding water.

Any seal concrete additional to that shown on the Plans shall be at no additional cost to the County and shall be included in the unit Contract price bid for the caissons.

The Contractor shall have available and provide dependable mixing plants of sufficient capacity and sufficient backup system and equipment to ensure the continuous placing of tremie concrete from beginning to completion of concrete placement without interruption.

Concrete shall be deposited by tremie methods. Concrete deposited under water shall be carefully placed in compact mass in its final position in such a manner and by means of a sufficient number of tremies to produce a continuous complete homogeneous concrete monolith of the full foundation area and of the thickness required by the Plans. If placement of tremie concrete is interrupted and placement can proceed before initial setting time of the concrete has expired, the tremie shall be removed, resealed, and restarted adjacent to the tremie concrete in place. If the interruption is greater than the initial setting time of the concrete, the point of stopping shall be considered a construction joint. Finished elevation at the top of sound seal concrete shall not be below more than 6 inches from plan grade.

Pumping to dewater the sealed caisson shall not commence until the concrete seal has sufficiently set to withstand the hydrostatic pressure, but in no case shall dewatering begin less than 5 calendar days after the seal concrete has been placed.

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6-22.3(4) USE OF EXPLOSIVES

Explosives may not be used in the loosening of existing materials to be dredged or otherwise removed from within the dredge wells.

6-22.3(5) CAISSON COFFERDAMS

The Contractor shall contain the construction of the caissons within the enclosure of a cofferdam constructed of sheet sheeting with interlocking joints until such time as that partially constructed cofferdam has been sunk to a level that the leading edge of the cutting shoe is a minimum of 30 feet from the estimated tip elevations shown in the Contract Plans unless otherwise proposed by the Contractor and approved by the Project Engineer.

All steel sheeting used to construction the caisson cofferdams shall be driven to a depth of the glacially overridden soils, or to refusal, whichever occurs first as determined by the Project Engineer.

The Contractor shall seal the cofferdam from the Duwamish Waterway water column by controlling the permeability of the cofferdam sheeting by use of membranes or sealing the sheet pile interlocking joints from the floor of the waterway to a minimum elevation of +12.0 feet. The method used to seal the cofferdams will be at the Contractor's option provided the methods used do not impart harmful materials, chemicals or particulates into the water column and minimizes the potential exchange of water from the confines of the cofferdam to the Duwamish Waterway. Methods used to seal the cofferdams shall be submitted to the Project Engineer for review and approval.

All sheet pile splices shall consist of full penetration shop welds in accordance with the current version of American Welding Society A1.1.

The Contractor shall excavate and dispose of portions of the backfill material between the partially completed caissons and the caisson cofferdam walls prior to removal of the caisson cofferdam sheeting. Remove the caisson cofferdam backfill material down to the elevation of -7 feet or to the elevation of the Duwamish Waterway floor (mud line), whichever is lower.

6-22.3(6) SONAR INSPECTION

The Contractor shall furnish all personnel and equipment necessary to conduct the underwater sonar inspection and shall operate the sonar and supporting equipment, under the direction of the Project Engineer and in such manner as to obtain optimum results from the equipment, in viewing the bottom surfaces of the excavations for dredged caissons.

A. Technical Representative

A qualified technical representative of the sonar service provider shall be present on the work site at all times to set-up the equipment; operate the sonar, computer and software; provide technical assistance in remedying or repairing any malfunction of the equipment; and to consult with the Project Engineer and the Contractor. Electronic records of the entire sonar inspection are to be furnished to the Project Engineer upon completion of the Work. The technical representative shall remain at the work site for as long as his or her presence is

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needed, as determined by the Project Engineer, but not less than such time as needed to complete the inspection of the entire caisson excavation, and shall be available on short notice at any time during caisson work on the project.

B. Equipment

A list of the proposed equipment to be furnished by the Contractor for sonar inspection shall be submitted to the Project Engineer for review and approval. Such gear shall include:

- Digital Scanning Sonar
- Monitor
- Recording Device (CD or DVD)

The Contractor shall develop a method for sonar handling and orientation at the required angles and depths and submit it to the Project Engineer for approval. Such method shall include provisions to accurately determine the depth and orientation during the under-water sonar inspection as well as later viewing of the files. Other methods and equipment for controlling the sonar will be considered subject to the approval of the Project Engineer upon achievement of a satisfactory sonar record.

The Contractor shall furnish all necessary supplies, accessories, fuel, barge, etc., necessary for operation of the sonar equipment, including cable, power supply and all incidentals.

C. Drawings

The Contractor shall submit to the Project Engineer for approval, layout drawings showing the relative position of all components of the sonar system. The information submitted shall include a written description of the operating procedure in step-by-step sequence and shall state the source of power.

D. Sonar Inspection

Underwater sonar inspection of the excavations will normally be made only after dredging is complete to the plan elevation of the founding material. It is essential that the excavation be cleaned of all loose fragments, sediment and turbidity prior to its inspection.

The sonar shall be lowered slowly to scan the excavation inside the caissons below the sides of the dredge wells. The sonar shall be positioned in each dredge well so that the optimum clarity of detail and complete coverage of the excavation can be obtained. The sonar is to be lowered in all dredge wells. The sonar is to be scanned at sufficient elevation stops per dredge well for complete coverage. The top of the founding surface shall be scanned completely so that all areas of the founding surface can be observed. Unless otherwise directed by the Project Engineer, all scanning of the excavation shall be recorded on CD or DVD.

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E. Record of Inspections

Where required by the Project Engineer, the real-time image shall be displayed on the monitor by the Contractor for study and observation. All sonar scanning is to be recorded with notes of depth and location on CD or DVD and properly labeled as to caisson number along with project and Contractor identification. CD's and/or DVD's shall be furnished to and become the property of the Project Engineer upon completion of the Work.

6-22.3(7) FINAL DIVER INSPECTION

The Contractor shall furnish competent diver or divers to perform the final inspection of the caisson and the entire founding surface as directed by the Project Engineer. Subsequent to the final cleaning and sonar inspection, the Contractor shall coordinate and report the results of the divers' observations to the Project Engineer. Divers shall have communications with the surface and underwater cameras. The entire dive video and voice are to be recorded on DVD. The divers shall cover the entire founding area of the caisson. If remedial measures are necessary after the initial dive inspection, the divers shall re-inspect the area at no additional cost to the County.

The Contractor shall also furnish all necessary equipment and supplies associated with the final dive inspection.

6-22.3(8) SPECIAL EXCAVATION TESTING

The Contractor shall excavate and test the soils within the caisson cofferdams (required to be excavated) indentified within the Contract Plans on sheet CS25 as potentially contaminated soil for determination if the soil meets the requirements for open water disposal or upland disposal. The Contractor shall test and disposed of the soil in accordance with 2-02.3(4). If the soil meets the minimum requirements for open water disposal or upland disposal, the Contractor shall dispose of the soil accordingly. If the soils do not meet the minimum requirements for open water or upland disposal, the Contractor shall dispose of the soil in accordance with 2-02.3(4). That soil which is not required to be excavated by the Contractor's means and methods of construction need not be excavated or tested.

6-22.3(9) ANCILLARY CAISSON ITEMS

The Contractor shall provide and install ancillary caisson items as shown in the Plans including: trunnion anchor bolt assemblies, inclinometers wells, inclinometer well grout, manhole frames, manhole covers, manhole ladders, caisson access manhole assemblies, fiberglass reinforcement within the submarine cable windows and waterstops. The inclinometer well sleeves shall consist of galvanized pipe and shall be watertight and free of concrete and construction debris.

The County will provide the inclinometer casing. The Contractor shall install and grout in place the inclinometer casing within the inclinometer wells. Installation of the inclinometer casing shall be in accordance with the casing manufacturer's published instructions.

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6-22.4 MEASUREMENT

The bidder's and Contractor's attention is directed to 2-02.3(4) for information related to measurement of potentially contaminated soils.

Ancillary caisson items identified with 6-22.3(9) will not be measured for payment. All costs associated with ancillary caisson items as shown and noted in the Plans and as outlined in these Special Provisions and in the Standard Specifications shall be included in the pay item "Conc. Class 4000MP", per cubic yard.

Special excavation shall be considered the Work described in 6-22.3(8). Special excavation of contaminated materials confined within the cofferdams will be measured in original position by the cubic yards as a 71 feet by 71 feet square foot area between the neat line elevations as depicted within the Plans.

Caisson excavation of non-contaminated materials confined within the cofferdams completed subsequent to completion of Special Excavation, and prior to setting of the cutting shoe, will be measured in original position by the cubic yards as a 71 feet by 71 feet square foot area from the bottom of the plan specified Special Excavation elevation to the bottom of the backfill elevation within the cofferdam.

Caisson excavation completed subsequent to setting of the cutting shoe will be measured in original position by the cubic yards as a 59 feet by 59 feet square foot area extending from the top of the backfill within the cofferdam to a point 3 feet below the final cutting shoe tip elevation.

Steel reinforcing bar for caisson and epoxy coated Steel reinforcing bar for caisson will be measured as described for reinforcing steel as specified in Section 6-02.4.

Structural carbon steel for cutting shoe will be measured as specified in Section 6-03.4.

Concrete Class 4000P and Concrete Class 4000MP used for the caisson and distribution cap will be measured in place by the cubic yard to the neat lines of the Structure as shown in the Plans.

Concrete Class 4000P and Concrete Class 4000MP used for the cutting shoe will be measured in place by the cubic yard to the neat lines of the Structure as shown in the Contractor provided cutting shoe Plans.

Concrete Class 4000W used in the tremie seal will be measured from the over excavation neat line to the top of seal concrete neat line in final position by the cubic yards.

"Remove Caisson Obstruction", estimated

No other aspect of Work associated with construction if the caissons, in place and acceptable to the Project Engineer will be measured for payment. Specifically, the development, submittal and

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modifications of the Caisson Construction Manual and for design, furnishing, construction and removal of the caisson cofferdams and associated backfill, submarine cable openings including fiberglass reinforcement, testing of soils and design of the cutting shoes will not be measured for payment and shall be considered included in the cost of the Contract.

6-22.5 PAYMENT

The bidder's and Contractor's attention is directed to 2-02.3(4) for information related to payment of potentially contaminated soils.

A. Payment will be made in accordance with Section 1-04.1, for each of the following bid items that are included in the Proposal:

"Excavation for Caisson", per cubic yard.

The unit Contract price for "Excavation for Caisson" will be full compensation for all costs incurred for excavating, loading, hauling, barging, storing, dewatering and disposing of the material, installing cofferdams, and removing cofferdams as well as all transportation, labor, equipment and materials required, including hydraulic clam shell, crane, required bentonite, cofferdam materials. Payment for "Excavation for Caisson" will also be full compensation for preparing the dredge quality control plan and attending a pre-dredge conference if the Contractor chooses to utilize open-water dispose of the caisson excavation soils

"Special Excavation", per cubic yard.

The unit Contract price for "Special Excavation" will be full compensation for all costs incurred for excavating, storing, dewatering, loading, hauling, and disposing of the uncontaminated soil, as well as all transportation, labor, equipment, materials, including pumps, storage containers, hoppers and covers.

"Str. Carbon St. - Caisson Cutting Edge", per pound.

The unit Contract price for "Str. Carbon St. - Caisson Cutting Edge" will be full pay for all costs in connection with furnishing all materials, labor, tools, and equipment necessary for the manufacture, fabrication, transportation, and installation of the structural carbon steel caisson cutting edge, including the transportation of the caisson cutting edge to the Site, placement, placing blocking on the backfill, and erecting.

"Epoxy Coated St. Reinf. Bar for Caisson", per pound.

The unit Contract price for "Epoxy Coated St. Reinf. Bar for Caisson" will be paid as described for ""Epoxy-Coated St. Reinf. Bar" as specified in Section 6-02.5.

"St. Reinf. Bar for Caisson", per pound.

The unit Contract price for "St. Reinf. Bar for Caisson" will be paid as described for "St. Reinf. Bar" as specified in Section 6-02.5.

"Conc. Class 4000P", per cubic yard.

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The unit Contract price for “Conc. Class 4000P” will be full pay for all costs in connection with furnishing all materials, labor, tools, and equipment necessary for the materials, delivery, placement, cleaning, transportation, and monitoring of the concrete for the caisson, cutting shoe, and distribution cap.

“Conc. Class 4000W”, per cubic yard.

The unit Contract price for “Conc. Class 4000W” will be full pay for all costs in connection with furnishing all materials, labor, tools, and equipment necessary for the materials, delivery, placement, sonar inspection, cleaning, transportation, and monitoring of the concrete tremie seal concrete.

“Conc. Class 4000MP”, per cubic yard.

The unit Contract price for “Conc. Class 4000MP” will be full pay for all costs in connection with furnishing all materials, labor, tools, and equipment necessary for the materials, delivery, placement, sonar inspection, cleaning, transportation, and monitoring of the mass concrete. The unit Contract price for “Conc. Class 400MP shall also be full pay for all costs associated with ancillary caisson items including: trunnion anchor bolt assemblies, inclinometers wells, inclinometer well grout, manhole frames, manhole covers, manhole ladders, caisson access manhole assemblies, fiberglass reinforcement within the submarine cable windows and installation of the County provided inclinometer casing.

No other aspect of Work, including but not limited to the Caisson Construction Manual, the caisson cofferdams and other Work as described in the Contract Documents for construction of the caissons, in place and acceptable to the Project Engineer, will be paid for except as described in 6-22.5.B of this Special Provision. All other aspects of the Work shall be considered included in the price bid for other pay items.

B. Payment for Removing Caisson Obstructions

1. Payment for removing, breaking-up, or pushing aside, shaft obstructions, as defined in subsection 6-22.3(2) of this Special Provision, will be made for the changes in caisson construction methods necessary to deal with the obstruction. The Contractor and the Project Engineer shall evaluate the effort made and reach agreement on the equipment and employees utilized, and the number of hours involved for each. Once these cost items and their duration have been agreed upon, the payment amount will be determined using the rate and markup methods specified in Section 1-09.6. For the purpose of providing a common proposal for all bidders, the Contracting Agency has entered an amount for the item "Removing Caisson Obstructions" in the bid proposal to become a part of the total bid by the Contractor.

2. If caisson construction equipment is idled as a result of the work required to deal with the obstruction and cannot be reasonably reassigned within the project, then standby payment for the idled equipment will be added to the payment

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calculations. If labor is idled as a result of the work required to deal with the obstruction and cannot be reasonably reassigned within the project, than all labor costs resulting from Contractor labor agreements and established Contractor policies will be added to the payment calculations.

3. The Contractor shall perform the amount of obstruction work estimated by the Contracting Agency within the original time of the Contract. The Project Engineer will consider a time adjustment and additional compensation for costs related to the extended duration of the shaft construction operations, provided:

   a. the dollar amount estimated by the Contracting Agency has been exceeded, and

   b. the Contractor shows that the obstruction removal work represents a delay to the completion of the project based on the current progress schedule provided in accordance with Section 1-08.3.

6-23 FRP MAINTENANCE WALKWAYS (NEW SECTION)

6-23.1 DESCRIPTION

This Work consists of furnishing all labor, materials, equipment and incidentals necessary to join parts, install the fiberglass reinforced polymer (FRP) Maintenance Walkway and access platforms as specified on the Contract Documents and herein. The Contractor is permitted to provide the walkway sections as shown on the Plans or to provide an alternate design, provided it is in conformance with these specifications. When a Contractor designed walkway is provided, this item shall also include the complete design of the proposed walkway, which shall be approved by the Project Engineer.

6-23.2 MATERIALS

With the exception of molded gratings, all FRP products shall be manufactured using a pultrusion process utilizing vinyl ester resin with flame retardant and ultraviolet (UV) inhibitor additives. The flame retardant FRP shapes shall achieve a flame spread of 25 or less in accordance the ASTM test method E-84, Standard Test Method for Surface Burning Characteristics of Building Materials.

Structural shapes and plates, including rails and posts, shall be made from glass fabrics/fibers and vinyl ester resin with fire retardant additives to meet a flame rating of less than 25 per ASTM E-84 and meet the self extinguishing requirements of ASTM D-635, Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position. All structural shapes shall contain a UV inhibitor. Structural FRP member composition shall consist of a glass fiber and fabric with vinyl ester resin matrix, approximately 50% glass by weight. Glass strand rovings with continuous strand glass mats or stitched reinforcements shall be used for FRP walkway panels.

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The FRP grating shall be fabricated from bearing bars and cross rods manufactured by the pultrusion process. The glass fiber/fabric reinforcement for the bearing bars shall be a core of continuous glass strand rovings. Grating shall be shipped from the manufacturer, palletized and banded with exposed edges protected to prevent damage in shipment. Each piece shall be clearly marked showing manufacturer's applicable drawing number. The bearing bars shall be joined into panels by passing continuous length fiberglass pultruded cross rods through the web of each bearing bar. A continuous fiberglass pultruded bar shaped section shall be wedged between the two cross rod spacers mechanically locking the notches in the cross rod spacers to the web of the bearing bars. Continuous chemical bonding shall be achieved between the cross rod spacers and the bearing web and between the bar-shaped wedge and the two cross rod spacers locking the entire panel together to give a panel that resists twist and prevents internal movement of the bearing bars. Cross rod spacing shall not exceed 6 inches. All bearing bars shall be coated with polyurethane coating of a minimum thickness of 1 mil. Fiberglass grating and stair treads shall be made from chemical resistant, fire retardant vinyl ester resin system with antimony trioxide (or equivalent) added to meet the flame rating of 25 or less in accordance with ASTM E-84 testing and meet the self-extinguishing requirements of ASTM D-635. UV inhibitors are added to the resin.

The top surface of all walkways shall be coated with epoxy and sand grit to attain adequate friction.

After fabrication, all cut ends, holes and abrasions of FRP shapes shall be sealed with a compatible resin coating of at least 25 mils in thickness.

Hold down clamps shall be type 316L stainless steel bolted through top of the supporting member. A minimum of 4 each per panel shall be provided and the maximum spacing between hold down clamps shall not exceed 5 feet.

The color of all FRP components shall be gray, and shall match color number 36357 in accordance with Federal Standard 595. A sample piece of grating, railing and supporting member shall be submitted to the Project Engineer for approval prior to fabricating any FRP material. The color of the FRP shall not be a paint or top coating but shall be throughout the thickness of the member.

Splices in supporting members will not be permitted. The supporting beams shall be shipped to the site the full length of the segment as detailed on the Contract Documents.

Polyurethane adhesive materials required shall be specified and applied in accordance with manufacturer's instructions. The minimum ultimate adhesion strength shall be 1000 psi.

Steel Components of the FRP Walkway shall meet the requirements listed in the Contract Plans.

Mechanical properties of all FRP material shall meet or exceed the values listed in Table 1.

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1 **Table 1**

MECHANICAL PROPERTIES	ASTM*	UNITS	VALUE
Tensile Stress, LW	D-3039	psi	30,000
Tensile Stress, CW	D-3039	psi	7,000
Tensile Modulus, LW	D-3039	10^6 psi	2.5
Tensile Modulus, CW	D-3039	10^6 psi	0.8
Compressive Stress, LW	D-6641/ D-3410	psi	30.000
Compressive Stress, CW	D-6641/ D-3410	psi	15,000
Compressive Modulus, LW	D-6641/ D-3410	10^6 psi	2.5
Compressive Modulus, CW	D-6641/ D-3410	10^6 psi	1.0
Flexural Stress, LW	D-790	psi	30,000
Flexural Stress, CW	D-790	psi	10,000
Flexural Modulus, LW	D-790	10^6 psi	1.8
Flexural Modulus, CW	D-790	10^6 psi	0.8
Modulus of Elasticity, E	Full Section	10^6 psi	2.5
Shear Modulus	-------	10^6 psi	0.450
Short Beam Shear	D-2344	psi	4,500
Punch Shear	D-732	psi	10,000
Notched Izod Impact, LW	D-256	ft.-lbs/in.	25
Notched Izod Impact, CW	D-256	ft.-lbs./in.	4
Constituent Content (FVF)	D-3171		50%

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PHYSICAL PROPERTIES	ASTM*	UNITS	VALUE
Barcol Hardness	D-2583	-----	45
24 Hour Water Absorption	D-570	% max.	0.45
Density	D-792	Lbs./in.^{3}	.062-.070
Coefficient of Thermal Expansion, LW	D-696	10^{-6} in./in./ºC	8
ELECTRICAL PROPERTIES	**ASTM***	**UNITS**	**VALUE**
Arc Resistance, LW	D-495	seconds	120
Dielectric Strength, LW	D-149	Kv./in.	35
Dielectric Strength, PF	D-149	Volts/mil.	200
Dielectric Constant PF	D-150	@60hz	5
Fire Retardant Polyester and Fire Retardant Vinylester Structural Profiles:			
FLAMMABILITY PROPERTIES	**ASTM***	**UNITS**	**VALUE**
Tunnel Test	E-84	Flame Spread	25 max.
Flammability	D-635	-----	Nonburning

*There are no AASHTO equivalents for these ASTM designations:

D-149 *Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies*

D-150 *Standard Test Methods for AC Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulation*

D-256 *Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics*

D-495 *Standard Test Method for High-Voltage, Low-Current, Dry Arc Resistance of Solid Electrical Insulation*

D-570 *Standard Test Method for Water Absorption of Plastics*

D-635 *Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position*

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D-696 *Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement*

D-732 *Standard Test Method for Shear Strength of Plastics by Punch Tool*

D-790 *Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials*

D-2334 *Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates*

D-2583 *Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor*

D-3039 *Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials*

D-3171 *Standard Test Methods for Constituent Content of Composite Materials*

D-3410 *Standard Test Method for Compressive Properties of Polymer Matrix Composite Materials with Unsupported Gage Section by Shear Loading*

D-6641 *Standard Test Method for Determining the Compressive Properties of Polymer Matrix Composite Laminates Using a Combined Loading Compression (CLC) Test Fixture*

E-84 *Standard Test Method for Surface Burning Characteristics of Building Materials.*

6-23.2(1) DESIGN REQUIREMENTS

This section applies to Contractor-designed walkways. The design shall be performed using the allowable stress design method and shall utilize FRP materials with minimum properties as specified herein. Connections utilize steel components. If the intermediate and end walkway supports detailed on the Contract Documents are not utilized, the Contractor is responsible for coordinating with the Steel Fabricator prior to submitting the steel shop drawings. The Contractor design calculations and shop drawings shall be stamped and signed by a Professional Engineer certified in the state of Washington. No fabrication of any FRP material will begin until the Contractor receives approved shop drawings for both the Structural Steel and the FRP maintenance walkway.

6-23.2(2) LOADS

The live loading on the walkway shall be 100 PSF.

Wind Loading applied transversely to the walkway shall be 25 psf applied to the exposed walkway area.

Load Combinations shall be as specified in the AASHTO Standard Specifications for Highway Bridges, 17th Edition. Overstress shall be permitted for load combinations including wind load as specified in the code.

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The FRP railing system shall be designed to meet the railing and post loading requirements of International Building Code (IBC), Section 1607. However, the design of the members shall be by the allowable stress method utilizing safety factors defined in the following section.

Design live loads of FRP gratings shall not be less than 100 pounds per sq. ft. uniformly distributed. Grating and floor panel deflection at the center of a simple span shall not exceed span length/360.

6-23.2(3) DESIGN

Steel Connections shall be designed by the allowable stress design method in the 17th edition of the AASHTO Standard Specifications for Highway Bridges. The design shall be for the loading specified above.

FRP Material shall be designed using the manufacturer's allowable stress design equations with the following Safety Factors:

Type of Stress	Safety Factor
Bending	3.0
Shear	3.0
FRP Connection Design	4.0

The maximum permissible live load deflection for supporting members = L/360, where L = the span length of the member.

6-23.2(3) DIMENSIONS

The maximum depth of the walkway, not including the railings, shall be 8 inches. Minimum vertical clearance above the walkway shall be as specified on the Contract Plans. The minimum width of walkway, face of rail or post to face of rail or post shall be 3 feet – 0 inches. Railing height shall match those specified on the Contract Plans. The bottom of walkway shall be no lower than the walkway shown on the Contract Plans.

6-23.3 CONSTRUCTION REQUIREMENTS

Construction, Fabrication and Installation of the FRP maintenance walkway shall be performed in accordance with the manufacturer's instructions. The bottom of walkway shall be no lower than the walkway shown on the Contract Plans. Maximum dimensional tolerances of the FRP Components shall be within tolerances specified in published material provided by the manufacturer. The Contractor shall identify and match-mark all materials, items and fabrications for installation and field assembly.

All material shall be stored before, during, and after shipment in a manner to prevent cracking, twisting bending, breaking, chipping or damage of any kind to the materials or equipment, including damage due to over exposure to the sun. Any material which, in the opinion of the

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Project Engineer, has become damaged as to be unfit for use shall be promptly removed from the site of work, and the Contractor shall receive no compensation for the damaged material or its removal.

The following FRP manufacturers have detailed construction/fabrication requirements that shall be adhered to on this project:

1. Strongwell Corporation, 400 Commonwealth Ave., P.O. Box 580, Bristol, VA 24203-0580; Phone (276) 645-8000

2. Fibergrate Composite Structures Incorporated, 5151 Beltline Road, Suite 700, Dallas, TX 75254; Phone (972) 250-1633

3. Bedford Reinforced Plastics, 264 Reynoldsdale Road, Bedford, PA 15522-7401; Phone (814) 623-8125

4. Creative Pultrusions, Inc. 214 Industrial Lane, Alum Bank, PA 15521; Phone (814) 839-4186

6-23.4 MEASUREMENT

FRP Maintenance Walkway will be measured on a lump sum basis and shall include the complete execution of work described but will be paid for on a lump sum basis as described in Section 6-23.7. The Contractor is responsible for determining the quantity on which the bid is based. The weight of the FRP material shown in the Contract documents is approximate. No increase or decrease in the Contract lump sum bid price for the item will be made on the account of a discrepancy.

6-23.5 PAYMENT

The "FRP Maintenance Walkway" shall be included in the lump sum price for "Superstructure – Bascule Span" and "Superstructure – Bascule Pier" pay item which shall be full compensation for all costs in connection with furnishing all materials, labor, tools, and equipment necessary for the manufacture, fabrication, transportation, erection, and incidentals necessary to complete the Work.

6-24 BIRD CONTROL (NEW SECTION)

6-24.1 DESCRIPTION

This Work consists of furnishing all labor, materials, equipment and incidentals for installing a bird repellant system to prevent bird access, when the bridge is closed, to any areas where birds roost, nest or land, and to prevent birds from roosting, nesting or landing on any area underside of the structure and to prevent damage caused by droppings or nesting materials as specified on the Contract Documents and herein.

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6-24.2 MATERIALS

Bird repellent netting shall have openings no larger than 3/4 inch x 3/4 inch, manufactured by Nixalite of America Inc.; Bird-B-Gone Inc., Fly-Bye or an approved equal.

Bird repellent netting shall be attached to the structure in accordance with the manufacturer's recommendations and only at locations shown in the Plans. Tensioned steel wires shall not be used. Bird coil and liquid adhesive shall not be used.

Bird spikes shall be stainless steel, manufactured by Nixalite of America Inc.; Bird-B-Gone Inc.; Bird-X Inc. or an approved equal. Tips of the bird spikes shall overlap and shall completely cover protected area.

All stitching and connection hardware shall be stainless steel or other corrosion resistant material as recommended by the manufacturer.

6-24.3 CONSTRUCTION REQUIREMENTS

6-24.3(1) SUBMITTALS

Shop drawings of all fabricated bird control system shall be submitted to the Project Engineer for approval. Shop Drawings shall give all dimension, colors, materials, location and identification marks and complete schedule of materials. Shop drawings shall contain the Bridge Number, State and Federal Project Number, Bridge Name, County, Fabricator and Contractor in the Title Block. Fabrication shall not start until receipt of Project Engineer's approval marked "Approved" or "No Exception Taken".

Samples of each type of product shall be submitted for approval as specified in Section 6-24.2.

In addition to the above submittals, the Contractor shall supply a complete manufacturer's catalogue to the Project Engineer in the field and to the Engineer responsible for reviewing the shop drawings.

Fabrication shall not start until receipt of Project Engineer's approval marked "Approved" or "No Exception Taken".

Contractor shall clean all surfaces prior to the installation of the bird control system.

Contractor shall positively attach bird control system to utilities and not impact the utilities. The bird control system attached to utilities shall be mechanically fastened by means approved by the Engineer.

6-24.4 MEASUREMENT

For purposes of payment, the supply and installation of bird repellent netting, bird spikes and associated stitching and hardware will not be measured, and the payment for all Work necessary to complete the items including furnishing and installation on the approach spans, bascule piers and bascule superstructure will be included "Superstructure – South Approach Span", Superstructure – North Approach Span", "Superstructure – Bascule Pier" and Superstructure – Bascule Span", each lump sum.

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The Contractor shall be responsible for determining the quantities on which the bid is based. Representation the bird control shown on the Contract Plans is for representative examples only. No increase or decrease in the Contract lump sum bid price for the item will be made on the account of a discrepancy.

6-24.5 PAYMENT

All Work for providing and installing bird repellent netting, bird spike and associated stitching and hardware shall be considered included in the lump sum Contract prices for the related items for "Superstructure – South Approach Span", Superstructure – North Approach Span", Superstructure – Bascule Pier" and Superstructure – Bascule Span", and no additional compensation will be made.,

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DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATER MAINS, AND CONDUITS

7-01 DRAINS

7-01.1 DESCRIPTION

The following is added at the end of this section:

This Work also includes work consisting of constructing subsurface drains in accordance with the Contract. This Work shall include installation of solid and perforated pipe, filter material, filter fabric (geotextile), sidewalk drains, and gravel drains. Subsurface drains shall be constructed of gravel filter material and may include perforated pipe and filter fabric as detailed on the Plans.

7-01.2 MATERIALS

The following is added at the end of the list of materials:

Filter material per Section 9-03.12(4)

Joints, Rubber Gaskets per Section 9-04.4

Pipe and Tubing per Section 9-05

Geotextiles per Section 9-33.2(1) and Section 2-12

Notes: Unless otherwise indicated in the Contract (all pipe sizes are inside diameter):

1) Corrugated Polyethylene Drainage Tubing Drain Pipe shall be limited to less than 10 inch.

2) Corrugated Polyethylene Drain Pipe shall be limited to 12 inch minimum to 36 inch maximum.

Perforated PVC Subsurface Drain Pipe shall be limited to a maximum 8 inch. All reference to filter fabric shall be construed to mean a geotextile material as specified in Section 9-33.2(1) and Section 2-12.

7-01.3 CONSTRUCTION REQUIREMENTS

The following is added at the end of this section:

Trench shall be excavated to grade, line, and dimensions indicated on the Plans. The subsurface drain pipe shall be installed with watertight rubber gasketed joints.

The subsurface drain trench shall be dug to the required alignment grade only as far in advance of pipe installing as the Engineer will approve. The clear width of trench measured at the springline of the pipe in place shall be 24 inches, or 1 foot greater than the outside diameter of

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the pipe, whichever is greater. Standard Plan number 284 trench width is not applicable to drain pipe and subsurface drain pipe.

There shall be no mixing of filter material with backfill material. See Section 2-03.3(10) regarding selected material.

7-01.3(2) UNDERDRAIN PIPE

The following is added at the end of this section:

The filter material for pipe shall be damp when placed in the trench and shall be deposited uniformly on both sides of the pipe for the full width of the trench and to the springline of the pipe. The material shall be tamped in 4-inch lifts to provide thorough compaction under and on each side of the pipe. Succeeding lifts of gravel shall be deposited in 8 inch lifts and be thoroughly compacted to the depth shown on the Plans.

The geotextile (moderate survivability) shall be placed in the manner and at the locations as directed in the Contract. The surface to receive the geotextile, and the trench into which the geotextile is to be placed, shall be free of obstructions and debris. Should the geotextile be damaged during construction, the torn or punctured section shall be repaired by placing a piece of geotextile of sufficient size to cover the damaged area including a minimum 12 inch overlap with all surrounding geotextile. In places where the trench width is less than 1 foot, the minimum overlap shall be the trench width.

Clearances between drains and other utilities shall be maintained per Section 1-07.17(3).

All drain pipe shall be installed with the bell or larger end upstream, and shall be open, clean, clear of debris, and free draining.

7-01.3(3) JOINTS (NEW SECTION)

Polyvinyl Chloride (PVC) drain pipe shall be installed upstream with the bell end upstream. Corrugated polyethylene drain pipe shall be jointed with snap-on, screw-on, or wraparound coupling bands as recommended by the pipe manufacturer.

7-01.4 MEASUREMENT

The following is added at the end of this section:

Labor, materials, tools, and equipment necessary to install sewer cleanouts connected to the underdrain (or drain) pipe shall be considered included in the unit bid price per linear foot for Underdrain Pipe (Size) In. Diam.

7-02 CULVERTS

7-02.2 MATERIALS

The following is added at the end of the list of materials:

Debris Barrier per Section 9-05.18, 7-02.3(6)

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Debris Cage per Section 9-05.18, 7-02.3(7)

7-02.3(6) DEBRIS BARRIER
NEW SECTION

When shown in the Plans, debris barriers shall be constructed in accordance with the Plans and shall meet the requirements for safety bars as specified in Section 9-05.18 except, the steel shall be aluminized and not galvanized.

Aluminum coated steel shall meet the material requirements of AASHTO M-274 (ASTM A929).

7-02.3(7) DEBRIS CAGE
NEW SECTION

When shown in the Plans, debris cages shall be constructed in accordance with the Plans, King County Figure 7-028, and shall meet the requirements of Section 9-05.18 except the steel shall be aluminized and not galvanized.

Aluminum coated steel shall meet the material requirements of AASHTO M-274 (ASTM A929).

7-02.4 MEASUREMENT

The second paragraph shall be deleted and replaced with the following:

Beveled end sections will be considered as part of the culvert pipe and/or storm drain pipe shown in accordance with the Plans and will be measured as culverts and/or storm drain pipe.

The following is added at the end of this section:

The length of Schedule A ___, ___ In. Diam. Storm Sewer Pipe will be the number of linear feet of completed installation measured along the pipe.

Debris cages will be considered as part of the culvert pipe, storm drain pipe, or drainage structure shown in accordance with the Plans and will be measured as culverts or storm drain pipe.

Debris barriers will be considered as part of the culvert pipe, storm drain pipe, or drainage structure shown in accordance with the Plans and will be measured as culverts, storm drain pipe, or drainage structure.

7-02.5 PAYMENT

The following is added at the end of this section:

When shown in the Plans, all cost for providing materials, labor, and installing beveled end sections will be included in the unit Contract price per linear foot for “culvert pipe” or “Pipe, (Type), (Material), Size)”, per linear foot.

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When shown in the Plans, all cost for providing materials, labor, and installing debris barriers will be included in the unit Contract price per linear foot for "culvert pipe" or "Pipe, (Type), (Material), Size)", per linear foot.

When shown in the Plans, all cost for providing materials, labor, and installing debris cages shall be included in the unit Contract price per each for the "Catch Basin Type _, _ In. Diam (Description)" per each.

"Schedule A ___, ___ In. Diam. Storm Sewer Pipe", per linear foot.

7-04 STORM SEWERS

7-04.1 DESCRIPTION

The following is added at the end of this section:

Where called for in the Plans, storm sewer pipe shall be placed in accordance with the size and type designated. Alternates are not acceptable unless they are specified on the structure notes in the Plans.

This Work shall include hanging storm sewer pipe on the approach span pipe hangers.

7-04.2 MATERIALS

The following items are added to the list in the first Paragraph:

Pipe, SD, D.I. CL 50, 12 In.	9-05.13
Pipe, SD, D.I. CL 50, 18 In.	9-05.13
Pipe, SD, Conc. Reinf. C76 CL IV, 12 In.	9-05.7(3)
Pipe, SD, Conc. Reinf. C76 CL IV, 18 In.	9-05.7(3)
Pipe, SD, Conc. Reinf. C76 CL IV, 24 In.	9-05.7(3)
Pipe, SD, Steel Sch. 40, 8 In.	9-05.10

7-04.3(1) CLEANING AND TESTING

This section is deleted in its entirety and replaced with the following:

Testing of the storm sewer pipe except temporary storm sewer pipe will be required. Cleaning shall also be in accordance with Section 7-04.3(1)A, and 7-17.3(2)A.

7-04.4 MEASUREMENT

The following is added at the end of this section:

See Section 7-17.4 for measurement for Pipe (Use), (Material), (Class), (Size),

Pipe, SD, Steel Sch ___, ___ In. shall be measured per linear foot from center of inlet structure to center of inlet structure per linear foot.

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7-04.5 PAYMENT

The following is added at the end of this section:

See Section 7-17.4 and 7-17.5 for measurement and payment for Temporary Schedule A (Size) In. Diam. Storm Sewer Pipe.

See Section 7-17.5 for payment for Pipe (Use), (Material), (Class), (Size),

All fittings, coatings, expansion joints, and flexible expansion joints shall be included in the measurement and unit Contract price for "Pipe, SD, Steel Sch ___, ___ In.",per linear

7-05 MANHOLES, INLETS, CATCH BASINS AND DRYWELLS

7-05.1 DESCRIPTION

This section is deleted in its entirety and replaced with the following:

This Work consists of constructing manholes, inlets, drywells, catch basins and stormwater wet vaults and connecting to existing Structures of the types and sizes designated in accordance with the Plans, these Specifications, and the Standard Plans, in conformity with the lines and grades staked.

This Section also describes Work for rebuilding or rechanneling of existing manholes in accordance with the Contract at locations shown on the Plans. This Work also includes excavation, backfilling, and compaction as specified in Section 7-17.

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7-05.2 MATERIALS

The following is added at the end of this section:

Manholes Catch Basins, Inlets, Appurtenance, and Related	9-05.22, 9-05.24
Stormwater Wet Vault	9-05.23
Mineral Aggregate Type 9	9-03.12(3)A
Gravel Backfill for Drains	9-03.12(4)
Gravel Backfill for Foundations Class B	9-03.12(1)B

7-05.3 CONSTRUCTION REQUIREMENTS

The following is added at the end of this section:

Manholes, catch basins, and inlets shall be constructed of pre-cast components in accordance with the following COSP numbers:

Manholes	COSP 200a through 232
Catch Basins	COSP 240 through 267a

Catch Basin Type Special shall be constructed according to COSP (Bridge Drain) Numbers 265 and 290.

Manholes, catch basins and inlets in King County shall be constructed of precast components and standard frame, grate, or vaned grate as shown in the Plans in accordance with the following KCRDCS Figures: 7-003, 7-005, 7-006, 7-013, 7-014, 7-016, 7-017, 7-018, 7-022, 7-023, 7-025, 7-026, 7-027, 7-028.

Where shown on the Plans, catch basin or manhole control structures, emergency outfall structures, and down-turned elbows shall be installed as shown in the KCRDCS Figures (7-025, 7-026, 7-027, and 7-028) with solid locking lids or as indicated on the Plans.

Deviations from Standard Plans, shall require Shop Drawing submitted by the Contractor and approval by the Engineer for approval at least 14 working days before manufacture. Masonry units or concrete (masonry) rings may be used for adjustment of the casting to final street grade. Where shown in the Plans, Structures shall be installed carefully because the adjustment depth has been removed to maximize vertical clearances with utilities.

The cement concrete for manhole channel shall be Type 3000 with Class 2 fine aggregate and AASHTO Grading No. 67 coarse aggregate (Class 6 (3/4), per COS Section 5-05.3).

7-05.3(2) ABANDON EXISTING MANHOLES

This section is deleted in its entirety and replaced with the following:

Work shall include abandon catch basin, manhole or inlet as applicable to each structure designated on the Plans to be abandoned. The Contractor shall remove casting and debris; dewater; break down the structure to a depth of the cone sections or 4 feet below the surface, whichever is greater; plug the outlet pipe as specified in Section 2-02.3(5); and fill the remaining structure and void with mineral aggregate or concrete as follows:

Catch basins, inlets and manholes shall be filled with Mineral Aggregate Type 9 or Type 17 or crushed concrete compacted to 95% of maximum dry density per COS Section 2-03.3(14)E. Old Type 164 inlets shall be filled with Class 5 (3/4) concrete (see COS Section 5-05.3(2)). Inlet grates shall be delivered to the County. The upper portion of abandoned structure shall be replaced with material matching the existing pavement structure unless indicated otherwise in the Contract.

7-05.3(3) CONNECTIONS TO EXISTING MANHOLES

The following is added at the end of this section:

Connection to manhole structure shall be considered the same as Connections to Existing Manhole.

The Contractor shall verify invert elevations prior to construction. Discrepancies in invert elevations shall be immediately brought to the attention of the Project Engineer. The crown

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elevation of lateral pipes shall be the same as the crown elevation of the incoming pipe unless otherwise shown per the Plans. The existing base shall be reshaped to provide a channel equivalent to that specified for a rechanneled manhole (see Section 7-05.3(3)A).

The Contractor shall excavate around the manhole to prevent unbalanced loading. The manhole shall be kept in operation at all times, and the necessary precautions shall be taken to prevent debris or other material from entering the Sewer. This includes building a tight pipeline sewage bypass as required.

The Contractor shall core drill, line drill or wall saw an opening to match the size of pipe to be inserted. Where line drilling is the method used, the method of drilling holes shall prevent overbreakage. All openings shall provide a minimum 1 inch and maximum 2 inches clearance around the outside circumference of the pipe. Upstream pipes, except PVC pipe, penetrating the walls of manholes shall be placed with the bell facing out such that the bell is placed snug against the outside wall of the manhole as the angle of penetration allows. Pipe, except PVC pipe leaving or entering manholes shall be provided with a flexible joint within ½ of a pipe diameter, or 12 inches, whichever is greater from the outside wall of the manhole. After pipes have been placed in their final position, the surface area around the opening in the manhole and the surface of the pipe shall be cleaned of all dirt, dust, grease, oil and other contaminants and then roughened and wetted with water. The opening between pipe and broken out concrete shall be grouted as specified in Section 7-05.3(5)N. PVC connecting to an existing manhole shall be installed according to Section 7-05.3(5)N.

This Work shall also include reconfiguring the existing ladder, rungs, steps, handholds, and cover to meet the new connection configuration. This Work shall also include work and materials and labor for rechannel and/or rebuilding existing manholes.

7-05.3(3)A RECHANNEL EXISTING MANHOLE (NEW SECTION)

Rechanneling of an existing manhole shall include all as necessary work, such as excavating shelf and manhole bottom, filling existing channel or channels with concrete, installing the new channel or channels, constructing new pipe opening or openings, and finishing the channel(s) and shelf(ves). It shall also include the work of connecting the pipe to the manhole in accordance with Section 7-05.3(3) Rechanneling shall meet the requirements specified in Section 7-05.3(5)M.

7-05.3(3)B REBUILD EXISTING MANHOLE (NEW SECTION)

Where noted on the Plans, the Contractor shall rebuild the existing manhole per COSP numbers 200a and 208 to accommodate a new manhole frame and cover meeting the requirements of the COSP. Work required to rebuild an existing manhole includes excavation around the manhole; removal and salvage of the existing manhole frame and cover; removal of leveling or adjustment bricks or rings; and removal of the upper portion of the cone section to a depth yielding an opening of the inside diameter as indicated in the COSP. The cone section shall be rebuilt;

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leveling bricks or rings installed; new manhole steps and handholds installed meeting the requirements of Sections 7-05.3(5)F or 7-05.3(5)G, and a new frame and cover installed in accordance with Section 7-05.3(5)R.

7-05.3(5) MANHOLE (NEW SECTION)

A. Foundation Preparation

1. Dewatering

Dewatering of manhole, catch basin, and vault excavations shall comply with the applicable Sections of 7-17.2(4)3.

2. Foundation Preparation

Adequate foundation support shall be obtained by compacting the existing subgrade to a 95% for a 6 inch depth in accordance with Sections 2-09.3(1)C and 2-09.3(3)C. Where unsuitable foundation condition exists, removal of unstable material and replacement with compacted suitable or imported material will be required.

B. Bedding

1. Bedding and Foundation Support for Precast Base Section

Manholes, catch basins, and vaults constructed with precast base sections shall be placed to grade upon a 6 inch minimum thickness of Mineral Aggregate Type 9 per Section 9-03.12(3)A mixed with 4 sacks of Portland Cement per cubic yard of mineral aggregate, with sufficient water add to form a stabilized foundation. The mixed material shall be placed across the area of the excavation for the base to a minimum distance beyond the face of the manhole as indicated on the COSP and shall be graded to provide uniform bearing support with the precast section.

2. Bedding and Foundation Support for Cast-in-Place Base Section

All cast-in-place bases for manholes, catch basins, and vaults shall be poured to grade upon a properly prepared foundation as indicated in the COSP. Imported mineral aggregate or crushed surfacing base course shall be placed and compacted to the same limits specified in Section 7-05.3(5)B1. The concrete base shall meet the requirements indicated in the COSP.

C. Vacant

D. Reinforced Concrete

1. Concrete Mixture

Concrete shall meet the requirements of Section 9-05.24.

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2. Curing

Upon completion of concrete casting, the precast components shall be protected and cured in a moist atmosphere maintained by injection of steam for the required length of time and at the required temperature to develop the compressive strength required for manhole components.

Precast components may also be water-cured by any approved method that keeps the components continuously moist during the curing period. Cast-in-place components shall be moist cured for a period not less than 10 calendar days, except that Type III Portland Cement Concrete shall be cured for not less than calendar 5 days.

A pigmented membrane curing compound may be applied in lieu of moist curing with prior approval of the Project Engineer.

E. Base

1. General

Base sections shall conform to the requirements for precast manhole sections in Section 7-05.3(5)F, except that the reinforced base slab shall be made an integral part of the section, and openings for the pipe shall be provided to meet project requirements as indicated on the Plans. The base slab thickness shall not be less than that indicated on the COSP, the base slab shall be cast monolithically with the wall section or otherwise constructed in such manner as to achieve a completely watertight structure.

Reinforcement of the base slab shall be in accordance with the COSP. The steel shall be placed 1-1/2 inches from the top, and shall extend into the wall of the manhole section and be tied to the longitudinal steel when called for in the COSP. The walls of the base section shall be reinforced in accordance with ASTM C 478. Openings to received pipe shall be circular, and shall be held to the minimum size possible to accommodate the pipe to be inserted and to effectively seal the joint. Resilient connectors conforming to ASTM C 923 may be used at the Contractor's option.

2. Precast Base

The base shall be carefully placed on the prepared bedding so as to be fully and uniformly supported in true alignment and ensuring that all entering pipes can be inserted on proper grade.

All lift holes shall be thoroughly wetted and then completely filled with mortar and smoothed both inside and out to ensure watertightness. All joints between precast sections shall be rubber gasketed joints.

Precast sections shall be placed and aligned to provide vertical sides and vertical alignment of the ladder rungs. The completed manhole shall be rigid, true to dimensions, and watertight.

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In precast manhole sections where steel loops have been provided in lieu of lift holes, the loops shall be removed flush with the inside wall surface after the manhole has been completed. No sharp cutoff protrusion will be permitted. If concrete spalling occurs as a result of the loop removal, the spalled area shall be restored in a workmanlike manner to a uniform smooth surface with mortar.

All precast manhole bases, catch basins, and vaults shall be manufactured with thin-walled concrete blockouts for pipe connections conforming to pipe size(s) and alignment(s) shown on the Plans. Blockouts shall contain no reinforcing steel. Removal of reinforcing steel or of any concrete beyond the blockouts will not be allowed. Openings for pipe connections in COSP manhole types 200, 201, and 202 shall be no less than the outside diameter of pipe plus 4 inches. Openings for pipe connections to COSP manhole types 200, 201, 202, 203, 204, 205, and 206 shall be no larger than the outside diameter of pipe plus the manhole wall thickness.

3. Cast In-Place Base

The first precast section shall be placed on the cast-in-place bottom slab and shall be carefully adjusted to true grade and alignment. The bottom slab shall be constructed in accordance with the COSP. The Contractor prior to placing the bottom slab of the manhole shall inspect the existing pipe which the manhole is to be built around. If the existing line is in bad condition, the Contractor shall immediately notify the Project Engineer to replace the pipe. The bottom slab shall not be placed prior to the replacement of the damaged pipe.

The first manhole section shall be uniformly supported by the base concrete, and shall not bear directly on any pipe.

All lift holes and openings around pipes on precast components and cast-in-place bases or Structures shall be thoroughly wetted, completely filled with mortar, and smoothed and pointed both inside and out to ensure watertightness.

Precast sections shall be placed and aligned so as to provide vertical sides and vertical alignment of the ladder rungs. The completed manhole shall be rigid, true to dimension, and watertight.

F. Precast Wall Sections

Reinforcement for standard (riser) sections shall consist of a single caged steel, placed at the approximate center of the wall section. The cage shall be welded at every circumferential wire, or lapped 40 diameters and tied. The welded splice shall develop a tensile strength of 50,000 psi.

Joints between sections shall be tongue and groove, and shall provide 1.2 inch nominal annular space and a minimum 1-1/4 inches lap.

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No more than two lift holes shall be cast into each section. Holes shall be so located as to not damage reinforcing or expose it to corrosion. At the manufacturer's option, steel loops may be provided for handling, in lieu of lift holes.

Steps shall be installed in each section so that sections placed together in any combination provide a continuous vertical ladder with rungs equally spaced at 12 inches. The lowest rung shall not be more than 16 inches above the shelf.

Steps shall project uniformly from the inside wall of the manhole per COSP number 232, and KCRDCS Figure 7-011 and shall be cast or firmly grouted in place to ensure complete watertightness.

G. Precast Cones

Standard precast cones shall provide reduction in diameter within range of height from not less than 18 inches to a maximum of 24 inches. See the COSP for cone dimensions. Jointing of cone section to the riser sections shall be similar to jointing between riser sections, but the top surface of the cone section shall be flat and at least 5 inches wide, radially, to receive adjustment bricks. Wall thickness shall be 4 inches minimum, and reinforcement shall conform to the requirements specified for standard sections of the larger diameter. Steps shall be provided as specified for standard precast sections, and an additional step or handhold shall be provided in all concrete cones on the side opposite the ladder steps as about midheight of cone section as shown on COSP number 208.

No more than two lift holes shall be cast into each cone, and they shall be located so they do not damage reinforcing or expose it to corrosion. At manufacturer's option, steel loops may be provided for handling in lieu of lift holes.

Handholds (steps) installed in leveling bricks or flat slab shall be modified to allow a minimum clear opening of 21 inches measured at the shortest dimension, but the handhold shall not be less than 3 inches from the inside face of the wall.

H. Flat Slab Covers

Standard flat slab covers shall be a minimum of 8 inches thick and shall conform to the outer dimension of the standard sections upon which they are to be placed. Details of the opening location and reinforcing shall be as shown on the COSP.

I. Flat Slab Reduction Sections

Reductions to 24 inch and 48 inch openings can be made by means of a flat slab reducing section as shown on COSP numbers 200 through 206, "b" series and KCRDCS Figure 7-011. Standard flat slab covers shall be a minimum of 8 inches thick and shall conform to the outer dimension of the standard sections upon which they are to be placed.

J. Vacant

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K. Joints

Joints between precast manhole components shall be rubber gasketed in a manner similar to pipe joints conforming to ASTM C 443. Shop drawings of joint details in COSP numbers 200b and 201b, and of end details in COSP numbers 202b, 203b, 204b, 205b, and 206b shall be submitted to the Project Engineer for approval at least 10 working days before manufacture. Completed joints shall show no visible leakage and shall conform to the dimensions of ASTM C 478.

L. Vacant

M. Manhole Channels

All manholes shall be channeled unless otherwise specified in the Contract.

Manhole channels shall conform to the curvature of the connecting pipes. Manhole channel slopes shall be made to conform accurately to the Sewer grade and shall be brought together smoothly with well rounded junctions. Where pipe connections have differing grades or differing invert elevations or differing inside diameters, a smooth transition in channel grade(s) or side(s) is required. Channel sides for each pipe shall be carried up vertically from the I.D. at the springline to the crown elevation of the pipe. The concrete shelf between channels shall be smoothly finished and warped evenly with slopes to drain.

N. Manhole Pipe Connections

All pipes, except CMP, entering or leaving the manhole shall be provided with flexible joints within ½ of a pipe inside diameter or 12 inches, whichever is greater, from the outside face of the manhole structure and shall be placed on firmly compacted bedding, particularly within the area of the manhole excavation which normally is deeper than that of the Sewer trench. Openings surrounding pipes entering the manhole shall be completely filled with a non-shrink cement sand grout and shall be finished flush with the remaining manhole concrete wall surfaces to ensure watertightness. PVC pipe connecting to manhole shall be provided with a manhole adapter complete with gasket and approved by the Project Engineer.

O. Backfill

Backfill around drainage structures, such as manholes. Catch basins, inlets, vaults, and related Structures, shall consist of suitable material and shall be placed as a backfill in accordance with Section 2-09.3(1)E and Type 1 Compaction Section 7-17.3(3).

P. Manhole Grade Adjustment

The Contractor shall be responsible for selecting the appropriate precast concrete manhole components, allowing for a maximum height of 2 foot 2 inch from the top of the cone section or top slab to the finished surface grade for installation of the manhole frame and cover including 8 inches minimum for leveling or adjustment brick, or concrete collar. The surface grade for frame and cover on unimproved roadways shall match the adjacent existing roadway surface.

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Final elevation and slope of the frame and cover shall conform to the finished grade. All joints in the brick or ring adjustment shall be filled with mortar, and the casting shall be seated in mortar placed on the top brick course. A 3/8-inch thick mortar lining shall be installed inside and outside the adjustment section to provide a smooth, watertight finish.

See Sections 7-05.3(6)C and 7-05.3(6)D for additional specifications for adjust manhole or catch basin to grade.

Q. Ladder, Steps and Handholds

The Contractor shall submit to the Project Engineer for approval at least 10 working days in advance of starting work, the single material of choice for step, handhold, and ladder from the COS Section 9-12.2 materials available, and shall consistently use this single chosen material in every drainage Structure. Should the Contractor request a different material between or among different drainage structures, then the submittal shall be clear in identifying which material is for which drainage Structure.

Base sections of precast manholes more than 3 feet in height shall be provided with a ladder as detailed in COSP number 232. Where ladders are required, the bottom step in which the ladder is hung shall be manufactured of the same Material as the ladder.

Steps, handholds, and ladder made of copolymer polypropylene.

Where a flat slab is required in the construction of the manhole, the handholds normally required in this area may either be installed in the slab itself, or installed between the slab and leveling bricks, provided that the overall distance to the upper handhold or step, or the distance between the upper handhold or step to the top of frame, is no more than 16 inches. See Sections 7-05.3(5)F and 7-05.3(5)G for additional requirements.

R. Frame and Cover

The casting as shown on COSP number 230 and KCRDCS Figure 7-022, 7-023 may be used without extension rings for concrete pavement, or rigid pavement base if the top of casting is level with top of finished pavement and the casting flange is below the rigid pavement. Casting with depth less than the thickness of concrete pavement shall have frame extensions COSP number 231 epoxied to the casting frame by the frame manufacturer to allow the top of the casting to be level with the top of finished pavement, and the casting flange to be below the bottom of rigid pavement.

Where COSP number 230 casting is located within the concrete pavement or within the rigid concrete pavement base, reinforcing in the concrete slab shall be installed as specified in Section 5-05.3(9). COSP number 230 and KCRDCS Figure 7-022 castings located across, or located within 18 inch of a concrete pavement joint as measured from the casting barrel (not the flange), does not require Section 5-05.3(9) pavement reinforcing.

Total height of casting, ring extension, and leveling brick shall not exceed 26 inches.

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7-05.3(6) CATCH BASINS AND INLETS (NEW SECTION)

A. General

Construction requirements for catch basins and inlets shall follow all applicable Specifications of Section 7-05.3 for manholes and manhole pipe connections with the exception that no channeling is required. The "joint details by Contractor" in COSP number 243a shall be submitted by the Contractor to the Project Engineer for approval at least 10 working days in advance of ordering the catch basin.

Catch basins shall be installed as indicated on COSP numbers 260a, 260b, and KCRDCS Figure 7-017 unless the Contract indicates otherwise.

Connections to the catch basin shall be made only either at pre-drilled holes or at the concrete knockouts provided in the walls of the catch basin except, holes may be cored (avoiding reinforcing) to accept vault sump pump pipes. The Contractor shall determine beforehand the approximate elevation of the proposed inflow and outflow pipes by taking into account the length of inlet connection pipe. All these items have a bearing on the depth of the inlet pipe at the catch basin, and bottom elevation of the catch basin.

Where it is necessary for the Contractor to set the catch basin deeper to accommodate the deeper incoming pipe, the additional depth of the catch basin requires additional rows of leveling or adjustment bricks, up to a maximum of 16 inches, or installation of a one-foot to two-foot high concrete ring section below the top slab or cone section. This added concrete ring section shall be compatible with the standard catch basin section and shall accommodate rubber gasket joints.

B. Pipe Connections for Catch Basins and Inlets

All new catch basins shall be provided with openings or concrete blockouts for insertion of pipe connections and with a trap for the outlet pipe. Traps are required for City of Seattle inlet structures and as indicated in the Plans. Traps are not required for King County structures other than those shown in the Plans. The Contractor shall furnish and install new outlet traps for relocated and rebuilt catch basins. When connections are to be made to existing catch basins with no available hole or knockout, or where a "knockout" of adequate size is not provided, pipe connections shall be accomplished by core drilling, line drilling, or wall sawing. All openings shall provide a minimum of 1 inch and a maximum of 2 inches clearance around the circumference of the pipe. Where line drilling is the method used, the method of drilling holes shall prevent overbreakage. After pipes have been placed in position, the opening between pipe and wall of catch basin or inlet shall be grouted as specified in Section 7-05.3(5)N. See Sections 7-08.3(4) and 7-08.3(5) for additional pipe connection requirements.

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The outlet trap and the frame and grate shall be located as shown on the COSP number 267a, and shall be vertically aligned to allow reasonable access for removal and replacement of the outlet trap for vactor cleaning maintenance operations.

C. Catch Basin Grade Adjustment

Catch basin frame and cover grade adjustment shall be in accordance with Section 7-05.3(5)P.

D. Inlet Grade Adjustment

The inlet frame may be either cast into a concrete collar or set flange down on a minimum of one row of concrete alignment blocks and mortared. It shall not, in any case, be mortared to final grade until the final elevation of the pavement, gutter, ditch or sidewalk in which it is to be placed has been established and permission has been given by the Project Engineer to mortar the frame in place. The bottom of the inlet shall be level with the invert of the outlet pipe.

Existing Type 164 inlets shall be adjusted as shown on COSP number 268.

E. Relocate Existing Catch Basin or Inlet

Work required for relocation of existing catch basin or inlet shall include necessary excavation to remove without damage the existing catch basin or inlet, its frame and grate or cover and transporting and installing at the new location. Backfill shall consist of suitable material and compaction shall be in accordance with Section 2-09.3(1)E and Type 1 Compaction. Grade adjustment shall be in accordance with Sections 7-05.3(6)C or 7-05.3(6)D.

The Contractor shall furnish and install new outlet traps (see Section 7-05.3(6)B.

Existing Type 164 inlets shall be removed and disposed of when a project requires removal and replacement of pavement coating containing the Type 164 inlet.

F. Rebuild Existing Catch Basin

Where noted on the Plans, the Contractor shall rebuild the existing catch basin to accommodate a new frame and grate, or cover, as designated in the Contract. Work required to rebuild catch basin includes excavation, the removal of the existing frame and grate or cover, leveling or adjustment bricks, upper portion of catch basin chamber, and installing a new cone section, leveling or adjustment bricks and new frame and grate or cover. Grade adjustment shall be in accordance with Sections 7-05.3(6)C.

The Contractor shall furnish and install new outlet traps (see Section 7-05.3(5)B for outlet trap location requirements.

G. Stormwater Wet Vault

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Vaults shall be installed at the locations shown on the Plans. The Contractor may install, at no expense to the Contracting Agency, such additional boxes as may be desired to facilitate the Work. Vaults shall be installed accordance with the following:

1. Excavation shall be performed in accordance with Section 2-09.
2. Vaults shall be installed on 6-inches of gravel backfill for foundation, per Section 7-05.3 placed on a compacted or undisturbed level foundation.
3. All openings around penetrations shall be sealed and filled with non-shrink grout in accordance with COS Section 6-02.3(20), to prevent water and debris from entering the vaults.
4. Pipe, except PVC penetrating the walls shall be provided with a flexible joint within ½ of the pipe inside diameter, or 12 inches whichever is greater from the outside wall of the vault.
5. Backfilling around the Work shall not be allowed until the concrete or mortar has set. Concrete shall conform with criteria for concrete exposed to sea water per Section 6-02.
6. The interior bottom shall be formed and sloped to drain according to the Plans.
7. Upon acceptance of Work, vaults shall be free of debris.

Where water is encountered in excavating for vaults, water shall be removed during vault placing activities and until the vault is sealed and provisions are made to prevent floating of the vault. Dewatering and groundwater control shall be included in the bid item and no additional payment will be made. Excavation water or other deleterious materials shall not be allowed to enter the vault during the construction of the vault. However, see temporary sediment vault/trap and sump in these specifications for temporary use of the water quality wet vault as a temporary sediment trap.

Vault Grates Section 9-05.23 shall be designed by the vault Manufacturer and be aluminized and meet H-25 loading. Shop drawings shall be stamped by a Structural Engineer and submitted for review.

Vault Risers per Section 9-05.23 shall be constructed with precast collars and non-shrink grout to finished grade.

Vaults with traffic bearing lids shall be raised to final grade using ring risers to raise the cover only. All voids resulting from the adjustment shall be backfilled with materials matching adjacent surfacing material and compacted in accordance with Section 2-09.3(1)E.

Damage to the vaults and the associated drainage system from the Contractor's operations, shall be repaired to the Project Engineer's satisfaction at no additional cost to the Contracting Agency.

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New vaults shall be adjusted to be flush with the finished grade (but finished grade over the vault shall be "mounded up to prevent stormwater runoff from surface draining into the vault).

H. Temporary Sediment Vault/Trap and Sump

The Stormwater Wet Vault specified in Section 7-05.3(6)G may be constructed and used as a temporary sediment trap during construction. The Contractor shall construct the vault with all components including the top sections according to Section 7-05.3(5)G. The vault shall have risers extending to elevation 16.00 minimum and backfilled per plan. At no time shall the Contractor empty the vault completely during high tide, high river elevation, or any other circumstance without providing groundwater monitoring and verification to the Project Engineer that the groundwater elevation is at or below elevation 3.0. The vault shall be cleaned as necessary to keep sediment at or below one foot deep in the temporary conditions. At no time shall sediment be allowed to resuspend and flush into the river. The vault shall be cleaned (all silt and debris shall be vactored out) and the outlet shall be flushed free of silt, debris, or any other materials at the end of construction after the entire site has been stabilized for permanent sediment control.

This Work includes all materials, labor, and equipment to construct temporary sediment traps/sumps and maintain them during construction.

7-05.4 MEASUREMENT

The following is added at the end of this section:

Connection to existing manhole will be measured per each.

Stormwater wet vault per each shall include work for dewatering and groundwater control.

Temporary sediment vault/trap and sump will be measured per each.

Catch basins with control structures will be measured per each.

Catch basin additional height Type 2, 60 in. diam. control structure will be measured per linear foot for each additional foot over 10-feet. Measurement will be from flow line invert of the outlet pipe to the top of the manhole ring measured to the nearest foot.

Catch basins with through curb inlets will be measured per each.

7-05.5 PAYMENT

The second paragraph in this section is deleted and replaced with the following:

"Manhole Type _____, ____ In. Diam.", per each.

The unit Contract price for "Manhole Type _____, ____ In. Diam." shall include all costs for the Work required to furnish and install the manhole complete to finish grade, including excavation, bedding, mortar, non-shrink grout, brick, block, castings, channeling, ladder, steps, connections

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to pipelines, and backfill with suitable native or gravel backfill material for a manhole depth up to and including 10 feet.

The following is added at the end of this section:

"Connection to Existing Manhole", per each.

The unit Contract price per each for "Connection to Existing Manhole" shall be full payment for all tools, labor, and materials as necessary to rechannel and/or rebuild existing manhole per each.

"Stormwater Wet Vault", per each.

The unit Contract price per each for "Stormwater Wet Vault" shall be full payment for all Work to install the vault, including but not limited to internal components, precast cement concrete footing, sedimentation slab, vault ends, sides, and top sections, access hatch and grates and frames, manhole rings and covers, ladders, backfilling, compaction, dewatering, and groundwater control.

"Temporary Sediment Vault/Trap and Sump", per each.

The unit Contract price for "Temporary Sediment Vault/Trap and Sump" shall be full pay for all excavation, materials, labor, tools, equipment, and supplies necessary for constructing temporary sumps, sediment traps, and maintaining the Temporary Sediment Vault according to temporary grade conditions, stabilizing slopes draining into the vault, as well as furnishing and installing bedding, backfill, risers, lids, grates, ladders, flow control devices, and any cleaning of sump/trap and vaults as necessary including dewatering for temporary sediment trap use.

Locking solid metal cover and frame for catch basin, vaned grate, non-vaned grate, and frames, shall be included in the structures with which they pertain.

No additional payment shall be made should the Contractor require construction of temporary sediment vaults/traps and sumps in addition to those indicated on the Plans, or removed and reconstructed due to construction phasing, or made larger to accommodate additional runoff.

"Catch Basin Type ___, ___ In. Diam. Emergency Outfall Structure", per each.

"Catch Basin Type ___, ___ In. Diam. Control Structure", per each.

"Catch Basin Additional Height Type 2 60 In. Diam. Control Structure", per linear foot.

"Catch Basin Type ___ w/Through Curb Inlet", per each.

"Catch Basin Type ___, ___ In. w/Through Curb Inlet", per each.

"Catch Basin Type Special ( )", per each.

For all inlets, catch basins and manholes, and control structures; should native material not be suitable backfill, acceptable gravel backfill shall be considered included in the bid item for inlets, catch basins, and manholes per each.

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7-06 PIPE ANCHOR, CEMENT CONC. ANCHOR, TRENCH DAMS, TIDE VALVES (NEW SECTION)

7-06.1 DESCRIPTION

This Work consists of constructing concrete pipe anchors, cement concrete anchor(s), outfall trench dams, and tide valves. Prefabricated pipe anchors on tongue and groove concrete pipe and other pipes as designated in accordance with details indicated in the Contract.

7-06.2 MATERIALS

Pipe anchor/cement concrete anchor material shall meet the requirements for concrete exposed to sea water.

Trench dam materials shall conform to controlled density fill for pipe bedding and trench backfill per COS Section 9-01.5.

Backflow prevention outfall valve shall meet ANSI Class 125/150. The flat bottom duckbill valve shall be installed with the flap pointing downstream and not allow river current to force the valve flap open. The valve may be slip on with stainless steel bands (316) and have metallic support material encapsulated within the valve to hold the shape of the valve in position. The valve shall be one piece rubber construction with nylon reinforcement. The valve elastomeric material shall be resistant to halogenated hydrocarbons, oils, greases, sodium hydroxide, ozone, oxygen, methane, and general weathering. The valve shall have a minimum operating temperature range between -10 degrees F and +400 degrees F and have a minimum 4 psi backpressure and maximum of 6 psi backpressure rating with a maximum head loss of 1.5 feet.

7-06.3 CONSTRUCTION REQUIREMENTS

The tide valve shall be submitted to the Engineer for approval at least 14 working days prior to ordering or installation.

7-06.4 MEASUREMENT

No specific unit of measure shall apply to pipe anchor(s), cement concrete anchor(s), outfall trench dams, and tide valves.

7-06.5 PAYMENT

No specific payment shall be made for costs necessary to complete the Work described in Section 7-06 and compensation for all labor, materials, and equipment to construct pipe anchor(s), cement concrete anchor(s), outfall trench dams, and tide valves shall be considered incidental to other Bid items.

7-07 CLEANING EXISTING DRAINAGE STRUCTURES

7-07.1 DESCRIPTION

This section is deleted in its entirety and replaced with the following:

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This Work consists of cleaning, removing, and disposing of all debris and obstructions from existing culvert pipes, storm sewer pipes, sanitary sewer pipes, combined sewer pipes, drains, inlet structures, manholes, box culverts, grates, trash racks, or other drainage features within the limits of the project.

7-07.3 CONSTRUCTION REQUIREMENTS

Delete the first and second sentences and replace with the following:

All pipes and drainage structures that require cleaning shall be cleaned by flushing, rodding, or whatever means are necessary to provide unobstructed drainage.

7-08 GENERAL PIPE INSTALLATION REQUIREMENTS

7-08.1 DESCRIPTION

The following is added at the end of this section:

This Work consists of excavation, foundation preparation, bedding, backfilling and compacting for the construction of miscellaneous sewer and drain appurtenances other than those described in Sections 7-01, 7-17, and 7-18.

7-08.2 MATERIALS

The following is added at the end of this section:

Pipe, CB Conn., D.I. CL 50, 8 In.	9-05.13
Pipe, Inlet Conn., D.I. CL 50, 8 In.	9-05.13

Materials shall also meet the requirements in COS Sections 9-04, and 9-05.

7-08.3(1)A TRENCHES

The second paragraph is deleted and replaced with the following:

Trench width shall be according to COSP Number 284.

7-08.3(1)C BEDDING THE PIPE

The following is added at the end of this section:

Pipe Zone Bedding shall be considered (Bedding Class B or Bedding Class Special) and shall conform to bedding, jointing, backfilling in Section 7-17.2(4)B and COS 7-17.3(1)B.

Bedding Class Special shall conform to bedding, jointing, backfilling per COS and per Plans. See Section 2-15 Bridge/Building Monitoring for Utilities and Storm Drain Trenching for criteria to provide monitoring during trenching, pipe laying, and backfilling activities adjacent to, and under existing structures.

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7-08.3(1)D CONNECTIONS TO EXISTING SANITARY SEWERS (NEW SECTION)

When making a connection to an existing sanitary sewer line or manhole, the Contractor shall excavate and expose the existing facility where shown on the Plans. In the event there is no existing tee or wye, refer to COS Section 7-17.3(2)C3 "Cut-In Tee On Existing Pipe".

7-08.3(1)E PIPE INSTALLING, JOINTING, AND TESTING (NEW SECTION)

Testing for acceptance as provided in Section 7-17.3(4).

7-08.3(1)F CATCH BASIN CONNECTIONS (NEW SECTION)

Catch basin connections (Pipe, CB Conn. (Material) (Class), (Size)), are pipe lines connecting outlets of catch basins to a storm drain or other facility. Both the alignment and the slope shall be straight with the exception of maintaining clearances in accordance with Section 1-07.17(3). Ninety degree bends will not be allowed.

No connection shall be made to the catch basin outlet pipe until the excavation around the catch basin has been backfilled and compacted to an elevation which provides for pipe bedding and connection pipe. Bedding for catch basin connection pipe shall be Class B bedding.

Connection pipe may be deflected at the joint to avoid obstacles to within the allowable angular deflection recommended by the pipe manufacturer. Such deflection shall be watertight and allow rodding the pipe in a relatively easy manner. Where pipe joints must be deflected, the Contractor shall submit the manufacturer's pipe joint deflection criteria to the Project Engineer for approval. Under no circumstances will deflection or change of direction be allowed by cutting or trimming the end of the pipe on a bias or an angle. All pipe ends shall be normal angle.

The Contractor shall furnish and install a new outlet trap to the new outlet of the existing catch basin.

7-08.3(1)G INLET CONNECTIONS (NEW SECTION)

Inlet connections (Pipe, CB Conn. (Material) (Class), (Size)), are pipe connections from drainage inlets to catch basins or other approved outlets. Inlet connections shall be installed upgrade from catch basin openings or other originations in straight alignment. Where a straight alignment or a uniform slope is not feasible and curves are necessary, the altered alignment shall be made by deflecting each pipe in a smooth curve. Bends with angles greater than 22.5 degrees shall not be used. Each pipe joint deflection shall not exceed that necessary to maintain watertight connection as recommended by the pipe manufacturer. The Contractor shall submit the pipe manufacturer's pipe joint deflection criteria. Inlet connection slopes shall not be less than 5% nor more than 50% for any or all portions of the connection with or without deflection.

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Pipe connections to a catch basin or other approved outlet shall not be made until the compaction requirements as specified in Section 7-08.3(1)F have been met and the Work has been approved by the Project Engineer. Bedding for inlet connection pipe shall be Class B bedding.

7-08.3(1)H DROP CONNECTIONS (NEW SECTION)

Inside and outside drop connections, used in conjunction with different types of manholes to allow for abrupt drop in elevation of the inflow, shall be constructed as shown on COSP number 233, and at locations indicated on the Plans. The invert elevation of the outside drop connection will be specified on the Plans. The crown elevation of the inside drop connection shall match the crown elevation of the manhole outlet pipe.

7-08.3(1)I VERTICAL CONNECTION (NEW SECTION)

When making a connection to an existing sanitary sewer line, the Contractor shall excavate and expose the existing facility where shown on the Plans. Contractor shall verify elevations prior to construction in a manner not to disturb the existing pipe.

Vertical connections shall be constructed as detailed and noted in the Plans. Any damages to the existing pipe shall be immediately repaired by the Contractor at no expense to the Contracting Agency.

7-08.3(4) PLUGGING EXISTING PIPE

This section is deleted in its entirety and replaced with the following:

Where shown in the Plans or where designated by the Project Engineer, existing pipes shall be plugged with concrete. Care shall be used in placing concrete in pipe to avoid voids. Plugging existing pipe shall also include work elements for abandon and fill pipe, and plug pipe.

Contractor to verify utility lines are abandon and not in service prior to plugging existing pipe activity. For those utilities not abandoned and still in service, Contractor shall coordinate temporary shut-off of utility prior to plugging of pipe.

At location outside of bridge construction activity, pavement removal and restoration will be required to access pipe for plugging. Care shall be taken to not disturb normal daily activities in these areas. Contractor shall minimize amount of pavement disturbed and complete plugging of pipe in a timely manner. Pavement restoration shall be similar to pavement removed.

7-08.3(4)A ABANDON AND FILL PIPE (NEW SECTION)

Pipes designated on the Plans to be “abandoned and filled” shall be filled with a pumpable, flowable cement slurry completely filling the pipe.

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7-08.3(4)B PLUG PIPE
(NEW SECTION)

At each end of pipe designated on the Plans as "plug pipe", the pipe end shall be completely plugged with Cement Concrete, Class 5 (3/4), COS Section 5-05.3(2), for a minimum length of 12 inches or 2 pipe diameters (whichever is greater) with no voids.

7-08.3(5) CAPPING PIPE
(NEW SECTION)

Where shown on the Plans as "cap" pipe, pipe shall be cut and affixed with a cap. Contractor shall submit a plan to the Project Engineer for approval. Cap shall be installed in a manner to prevent leakage and withstand the existing pressures within the system. Cap shall be of the type to allow for future removal. Existing pipe shall not be damaged other than what is required to complete capping of pipe.

Contractor to verify utility line location and material type. Contractor to coordinate with Boeing for temporary shut-off of utility to complete capping of pipe.

At location outside of bridge construction activity, pavement removal and restoration will be required to access pipe for capping. Care shall be taken to not disturb adjacent existing utilities and normal daily activities in these areas. Contractor shall minimize amount of pavement disturbed and complete capping of pipe in a timely manner. Pavement restoration shall be similar to pavement removed.

7-08.4 MEASUREMENT

The following is added at the end of this section:

Measurement for "Pipe, CB Conn., (Material), (Class), (Size) will be by the linear foot of pipe installed between the tee or wye in the receiving Sewer and inside center of each catch basin.

Measurement for "Pipe Inlet Conn., (Material), (Class), (Size)" will be by the linear foot of pipe installed between the inside face of inlet, and the inside center of the catch basin.

Measurement for "Drop Connection, Outside, (Size)" will be per each.

Measurement for "Vertical Connection, (Size)" will be per each.

Measurement for "Pipe, CB Conn., (Material), (Class), (Size)" when the pipe is an outlet pipe from a flow control Structure it will be measured from the inside center of the flow control structure.

Measurement for "Capping Existing Pipe" will be per each.

7-08.5 PAYMENT

The following is added after the item "Plugging Existing Pipe", per each in this section.

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The unit Contract price for "Plugging Existing Pipe" shall include all costs for the Work required for pavement removal, excavation, cutting pipe(s), plugging pipe(s) and filling pipe when required, pipe removal and disposal, backfilling, and final pavement restoration.

The following is added at the end of this section:

"Pipe, CB Conn., (Material), (Class), (Size)", per linear foot.

"Pipe Inlet Conn., (Material), (Class), (Size)", per linear foot.

The unit Contract prices for "Pipe, CB Conn., (Material, (Class), (Size)" and "Pipe Inlet Conn., (Material), (Class), (Size)" shall include all costs for the Work required to furnish and install the pipe, including connections to catch basins or inlets, excavation, backfill, and compaction

"Drop Connection, Outside, (Size)", per each.

The unit Contract price for "Drop Connection, Outside, (Size)" shall include all costs for the Work required to furnish and install the complete outside drop connection as shown on COSP number 233a. The price paid per drop connection is in addition to the price paid for manholes and for the specified pipe that is replaced with ductile iron pipe.

"Vertical Connection, (Size)", per each.

The unit Contract price for "Vertical Connection, (Size)" shall include all costs for the Work necessary to furnish and install the vertical connection as detailed in the Plans including the insert tee, pipe, and pipe bend connecting to the sanitary sewer pipe.

Gravel Backfill for Pipe Zone Bedding shall be considered Bedding Class B and shall include all costs for the Work required to furnish and install bedding. Cost of Class D bedding shall be included in the Bid item for the pipe and therefore no separate or additional payment will be made for Class D Bedding.

"Capping Existing Pipe", per each

The unit Contract price for "Capping Existing Pipe" shall include all costs for the Work required for pavement removal, excavation, cutting pipe(s), capping pipe(s), backfilling and final pavement restoration.

7-13 FIRE PROTECTION WET HYDRANT SYSTEM (NEW SECTION)

7-13.1 DESCRIPTION

General Requirements: This special provision describes the requirements for furnishing, installing, testing and commissioning a fire protection wet hydrant system consisting of buried and exposed fire mains, backflow preventer and precast vault with accessories, valves, dry barrel hydrants for use by the fire department, electric heat trace system including heating cables and controls for freeze protection of exposed wet fire and domestic water mains and all other

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accessories required for a functional system. Provide an independent wet hydrant system on the north and south sides of the bascule piers and as indicated on the Plans.

The Plans indicate size, connections, and dimensional requirements of the various wet hydrant system components and are based on specific manufacturer's products indicated. Other manufacturers' units, listed under Materials, with equal performance characteristics may be considered.

This item shall include relocate existing hydrant located on Boeing property as shown on the Plans.

Comply with NFPA 14, "Standard for the Installation of Standpipe and Hose Systems" and NFPA 502, "Standard for Road Tunnels, Bridges and Other Limited Access Highways".

Comply with standards of authorities having jurisdiction pertaining to materials, hose threads, and installation.

Coordinate layout and installation of electric heating cables and system components with piping insulation installer and with power and control wiring provided.

7-13.2 MATERIALS

Materials shall meet the requirements of the following sections:

Buried Service Piping System	9-38.2(1)
Non-Buried Fire Piping System Below Bridge and at Bascule Piers	9-38.2(2)
Buried Force Main Piping	9-38.2(3)
Hydrants	9-38.2(4)
Gate Valves	9-38.2(5)
Ball Valves	9-38.2(6)
Automatic Air Vents	9-38.2(7)
Grout	9-38.2(8)
Backflow Preventers	9-38.2(9)
Underground Vaults	9-38.2(10)
Submersible Sump Pumps	9-38.2(11)
Heat Tracing System	9-38.2(12)
Expansion Joints	9-05
Mechanical Sleeve Seals	9-38.2(13)

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It is not intended that materials listed herein are to be necessarily considered equal or generally interchangeable for all applications. Those suitable for the project shall be specified in the Special Provisions or shown on the Plans. The pipe manufacturer shall test all pipe and fittings as required by these Standard Specifications and the standards referenced. The pipe manufacturer shall submit to the Project Engineer two (2) copies of all test results including a written certification that material to be delivered is represented by the samples tested and that such delivered materials meet or exceed the specified requirements. No pipe shall be delivered until test results and certifications are in the hands of the Project Engineer.

The Project Engineer shall have free access to all testing and records pertaining to material to be delivered to the job site. The Project Engineer may elect to be present at any or all material testing operations.

7-13.3 CONSTRUCTION REQUIREMENTS

7-13.3(1) GENERAL

Refer to Standard Specifications 7-09.3 for construction requirements and as described in these special provisions.

7-13.3(1) EXAMINATION

Examine areas, equipment foundations, and conditions, with Installer and Project Engineer present, for compliance with requirements for installation and other conditions affecting the installation. Examine roughing-in of fire-suppression piping systems.

7-13.3(2) WELDING

The shop and field welders and/or welding operators and welding procedures shall be qualified in accordance with the requirements of ASME Section IX of the Boiler and Pressure Vessel Code.

Major piping assemblies shall be shop fabricated to keep field welds to a minimum.

Field welding, in general, will not be permitted. In specific cases only, the Contractor will be allowed to field weld with the approval of the Project Engineer when sufficient proof is submitted that no other method is feasible.

All welds must have 100 percent penetration and smooth lines of fusion on the exterior and interior. Weld reinforcement shall not exceed 1/16-inch. Minimum thickness of the welded joint shall not be less than 90 percent of the pipe wall thickness.

Welds shall be examined in accordance with the requirements of ANSI B31.1. One hundred percent of the welds that are embedded or buried shall be examined by radiography. A minimum of 10 percent of all remaining circumferential butt welds shall be examined fully by random radiography. A report, interpreting the radiographs shall be submitted to the Project Engineer without recommendations.

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7-13.3(3) SUPPORTS

Provide hot dip galvanized steel hangers and supports as detailed on the Plans and Special Provisions to Section 6-02. Where supports are not specifically shown on the Plans, submit shop plan for proposed hangers and supports in accordance with 6-03.3(7).

7-13.3(4) HEATING CABLE INSTALLATION

Examine surfaces and substrates to receive heating cables for compliance with requirements for installation, tolerances, and other conditions affecting performance. Ensure surfaces which will contain the electric heating cables are free of burrs and sharp protrusions, and that the radius of the bends is equal or greater than that shown on the Plans.

Test cables for electrical continuity and for insulation resistance before installing. Proceed with installation only after unsatisfactory conditions have been corrected.

Cut cable to length required. Each circuit shall be of one unbroken length with no splices.

Electrical installation requirements are specified in Division 16 Sections. Plans indicate general arrangement of wiring, conduit, and specialties. Connect heating cables and other components to wiring systems.

Set field-adjustable thermostat and circuit-breaker trip ranges as indicated.

Protect installed heating cables, including leads, from damage before opening the bridge to vehicular traffic.

7-13.3(5) HEAT TRACE EQUIPMENT GROUNDING

Ground equipment in accordance with the NEC. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

7-13.3(6) HEAT TRACE TESTING

Test cables for electrical continuity and insulation resistance before energizing. Remove cables if measured resistance is less than 10 megohms to ground. Test cables to verify rating and power input. Energize and measure voltage and current simultaneously.

Repair or replace malfunctioning units. Retest as specified above after repairs or replacements are made.

7-13.4 MEASUREMENT

No specific unit of measurement will apply for the lump sum items of Fire Protection Wet Hydrant System, but measurement will be for the sum total of all items to be furnished and installed.

7-13.5 PAYMENT

Payment will be made in accordance with Section 1-04.1, for each of the following bid items that are included in the bid:

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"Fire Protection Wet Hydrant System", per lump sum.

7-15 SERVICE CONNECTIONS

7-15.1 DESCRIPTION

The following is added at the end of this section:

This Work also consists of installing temporary water line for the construction bypass and future abandonment of the existing water line on the North side of South Park Bridge, near the Boeing facility.

7-15.2 MATERIALS

The following is added at the end of this section:

Water Line Pipe	9-30.7(1)
Heat Trace	9-38.2(12)
Temporary Water Line	9-30.7(8)

7-15.3 CONSTRUCTION REQUIREMENTS

The following is added at the end of this section:

The Contractor shall provide the Project Engineer at least 10 working days advance notice when transfer of existing water service is required.

Service transfers may not be done until the new water line has been tested and accepted, and then connected.

The Contractor shall not remove or abandon existing pipe until either all existing service connections have been transferred or a new temporary service has been provided, and the Project Engineer approves.

Actual scheduling of water service connections and related work will be addressed at the Preconstruction Conference to take into account the actual number of connections required, least inconvenience to existing water service customers, sequencing of work, and other operation and construction activity needs.

The tees shall be mechanical joint (MJ) x mechanical joint x flange (FLG). Valves shall be MJ x FLG, and removable plugs shall be MJ for the service connection. The MJ plugs will be returned to the Contractor after SPU Water Operations completes the service connections.

Upon completion of work by SPU Water Operations, the Contractor shall make all final adjustments of valve boxes, water meter boxes, and rings and covers to final surface restorations in accordance with the Contract.

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7-15.3(2) WATER LINE PIPE (NEW SECTION)

All water line pipe installation shall meet the requirements in accordance with Section 9-30.7.

Concrete thrust blocking shall meet the requirements in accordance of COSP numbers 330a, 300b, 301a and 301b and be installed at locations identified in the Plans.

7-15.3(3) TEMPORARY WATER LINE (NEW SECTION)

This section specifies the requirements for a complete Contractor designed Temporary Water Line system. All temporary water line pipe, fittings, insulation and miscellaneous materials shall be installed in such a manner as to provide constant adequate water supply to the north control tower of the existing bridge and to avoid impeding traffic and access to abutting properties. Contractor shall submit a plan to the Project Engineer for approval a minimum of 2 weeks prior to removing existing service route.

Temporary water lines will be disinfected, flushed, and sampled for bacteriological testing. Contractor is responsible for procuring testing and if sample is found acceptable the Contractor shall provide the Project Engineer with a copy of testing results prior to placing temporary water line in service. Contractor shall be responsible for acquiring all permits required for implementing the temporary water line.

Contractor shall be responsible for maintaining and operating the system. Contractor shall notify the Project Engineer two working days in advance of decommissioning or any planned interruption of temporary water line. Contractor shall immediately notify Project Engineer if an unplanned interruption has occurred.

SPU Water Operations will make all required connections between the existing water main and meter.

All temporary water line pipes shall conform to the requirements in accordance with Section 9-30.7(8).

Concrete thrust blocking shall meet the requirements in accordance of COSP numbers 330a, 300b, 301a and 301b and be installed at locations identified in the Plans.

7-15.3(4) AIR RELEASE VALVE ASSEMBLY (NEW SECTION)

Air release valve assembly shall be installed per the Manufacturers recommendations at the locations indicated on the Plans. If locations are not identified on the Plans, Contractor to design and submit a plan for the location of two air release valve assemblies to the Project Engineer for approval. One air release valve assembly shall be located on each water line service connection to the control tower. The routing of the water line including elevations shall be included in the plan. Valves shall be tested and certified prior to installation.

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Air release valve assemblies shall be constructed as shown by COSP number 340a and 340b. A standard meter box shall be installed in non-traffic bearing areas; a Type 361 Frame and Cover shall be used for all other installations subject to vehicular traffic. Care shall be taken in locating the meter box or frame and cover such that it is not in any water course or in any other location subject to drainage or sewer contamination. Tops shall be set to conform to finished grade.

Drilling and tapping into the water main shall be performed by the SPU Water Operations.

7-15.3(5) PIPE INSULATION APPLICATION (NEW SECTION)

Install 2-inch thick mineral fiber insulation and cellular glass insulation, with factory-applied vapor retarder jacket and outer stainless steel field-applied jacket on pipes, valves and fittings.

A. Examination

Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application. Verify that systems and equipment to be insulated have been tested and are free of defects. Verify that surfaces to be insulated are clean and dry. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Preparation

Clean and dry surfaces that will be insulated. Remove materials that will adversely affect insulation application.

Coordinate insulation installation with the trade installing heat tracing and comply with requirements for heat tracing that apply to insulation.

Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use de-mineralized water.

C. Installation

Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment and piping including fittings, valves, and specialties. Install insulation materials, forms, vapor retarders, jackets, and thicknesses required for each item of equipment and pipe system as specified herein or shown on the Plans. Install insulation with longitudinal seams at top and bottom of horizontal runs. Keep insulation materials dry during application and finishing. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer. Install insulation with least number of joints practical. Install insulation continuously through hangers and around anchor attachments. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.

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Insulation Installation with Factory-Applied Jackets:

1. Draw jacket tight and smooth.
2. Cover circumferential joints with 3-inch wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches on center.
3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches on center.
4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.

Insulation Installation on Pipe Flanges:

1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

Insulation Installation on Pipe Fittings and Elbows:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

Insulation Installation on Valves and Pipe Specialties:

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.

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4. Install insulation to flanges as specified for flange insulation application.

Install accessories compatible with insulation materials, suitable for the service and that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

Repair damaged insulation facings by applying same facing material over damaged areas.

Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints. Install stainless steel metal jackets with a 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches on center and at end joints.

D. Field Quality Control

Inspect pipe, fittings, strainers, and valves, randomly selected by Project Engineer, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection shall be limited to three locations of straight pipe, three locations of coupled fittings, two locations of flanges and one valve location. All insulation applications will be considered defective work if sample inspection reveals noncompliance with requirements.

7-15.4 MEASUREMENT

The following is added at the end of this section:

Pipe, water line, (material), (size), including fittings will be measured per linear foot.

Bedding Cl. B, water line, (material), (size) pipe will be measured per linear foot.

Air release valve assembly 1 In. will be measured per each.

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7-15.5 PAYMENT

The following is added at the end of this section:

"Pipe, Water Line, (Material), (Size), including fittings", per linear foot.

The unit Contract price for "Pipe, Water Line, (Material), (Class), (Size), (Coating), including fittings" shall include all costs for the Work required as follows:

(1) Costs required for excavating, installing and joining pipe, backfilling and compacting native material, and disposing of and/or placing excess native material elsewhere;

(2) Cost of materials, including but not limited to, the pipe, fittings and pipe supports, locating wire, special coatings, and other items called for in the Contract. Where required, the costs of sand or foam cushioning between the Water Main and other pipes shall also be included;

(3) Costs for the Work required to furnish and install mechanical joint sleeves and pipe supports, including pipe hanger rods with nuts, single pipe rolls, steel angles, reinforcing bars, nuts, bolts, washers, mastic, and galvanizing;

(4) Costs required to perform all required procedures and testing for approvals ;

(5) Costs necessary for installing pipe on curves as shown on the Plans, including field changes involving standard lengths of pipe deflected at the joints;

(6) Costs for the Work required to furnish and install concrete thrust blocks;

(7) Costs of all material, labor and equipment associated with making pipe connections unless otherwise specified; and

(8) Costs for providing line and grade data for the finished water line installed

(9) Costs for the Work required to furnish and install Heat Trace for water line

If the pipe, its lining or its coating is damaged, the Contractor will be required, at the Contractor's sole expense, to repair the damage to an acceptable condition prior to installation.

Defective material or workmanship discovered as a result of tests will be addressed in accordance with Section 1-05.7.

"Bedding Cl. B, Water Line, (Material), (Size) Pipe", per linear foot.

The unit Contract price for "Bedding Cl. B, Water Line, (Material), (Size) Pipe" shall include all costs for the Work required to furnish and install bedding to the cross section shown in COSP number 285.

"Temporary Water Line", per lump sum.

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The unit Contract price for "Temporary Water Line" shall include all costs for the Work required for excavating, installing and joining pipe, pipe fittings, pipe straps and hangers, insulation, concrete thrust blocks, backfilling and compacting trench material, final pavement and disposing of and/or placing excavated materials. SPU Water Operations are to make the final service connection at the water meter.

"Air Release Valve Assembly 1 In." per each.

The unit Contract price for "Air Release Valve Assembly 1 In." shall include all costs for the Work required as follows:

(1) Costs for furnishing and installing the complete assembly including corporation, fittings, pipes, valve, meter box or ring and cover, and all excavation, backfill with native material and compaction;

(2) Costs to furnish and install the pipe between the corporation and air release assembly including fittings;

(3) Costs for testing the valve to Manufacturer's recommendation and certification for proper valve installation and operation;

(4) If the location of the air release valve assembly differs from that shown on the Plans and requires an increase of more than 10 feet of connection pipe, the excess of pipe over 10 feet will be paid by Contractor.

7-17 STORM DRAINS AND SANITARY SEWERS

The words "Storm Drains and" are added before the words "Sanitary Sewers" in the title of this section.

7-17.1 DESCRIPTION

The following is added at the end of this section:

This Work shall also describe work consisting of trench excavation, protective systems, foundation preparation, bedding, cut-in tees, pipe installing, jointing, backfilling, compacting and testing for the construction of Storm Drain, and sanitary, and combined Sewer.

All reference to "Sewer" in Specification Section 7-17 shall apply equally to construction of sanitary Sewer, combined Sewer, and Storm Drain. Side Sewer is addressed in Section 7-18.

7-17.2 MATERIALS

The following is added after the second list:

Temporary Schedule A 12 In. Diam. Storm Sewer Pipe	9-05.1(7)
Pipe, SD, Steel Sch. ___, ___ In.	9-05.10
Coated Steel Casing 18 In. Diam. and 0.25 In. Thick	9-05.10A

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Coated Steel Casing 16 In. Diam. and 0.219 In. Thick	9-05.10A

The last paragraph in this section is deleted and replaced with the following:

All pipe shall be clearly marked with type, class, date of manufacture, location of manufacturing plant, and thickness. Lettering shall be legible and permanent under normal conditions of handling and storage. Concrete pipe with elliptical reinforcement shall be clearly marked on the inside and outside of the pipe along the minor axis to identify top and bottom.

After installation, pipe shall be tested for leakage in accordance with Section 7-17.3(4).

Where steel or aluminum are referenced to in this Section in regard to a kind of storm sewer pipe, it shall be understood that steel is zinc coated (galvanized) or aluminum coated (aluminized) corrugated iron or steel and aluminum is corrugated aluminum alloy as specified in Sections 9-05.4, and 9-05.5.

It is not necessary that all storm sewer pipe on any project be of the same kind of material. However, all contiguous pipe shall be of the same size, material, thickness, class, and treatment and shall be that required for the maximum height of cover.

Pipe material used for sanitary sewers, combined sewers, and storm drains will be specified on the Plans and may be one or more of the following:

Flexible polyvinyl chloride (PVC), acrylonitrile butadiene styrene (ABS), corrugated metal, spiral rib, polyethylene or rigid pipe material including all concrete, ductile iron, and vitrified clay.

Aluminum or steel corrugated pipe may be used for Storm Drain when specified in the Contract.

Pipe shall have flexible gasketed joints unless otherwise specified in the Contract.

It is not intended that materials listed be considered equal or generally interchangeable for all applications. The Project Engineer will determine from the materials listed, those that are suitable for the project and will specify in the Contract.

Materials shall meet the requirements of the following sections:

Joint Materials and Non-shrink Cement Sand Grout	COS 9-04
Pipe	COS 9-05
Controlled Density Fill (CDF) – Pipe Bedding & Trench Backfill	COS 9-01.5

7-17.2(1) TEMPORARY SCHEDULE A PIPE (SIZE) (NEW SECTION)

When Temporary Schedule A or B storm sewer pipe is specified in the Plans, the Contractor shall provide the specified schedule and diameter, but has the option of furnishing any of the acceptable materials shown in the Storm Sewer Pipe Schedule Tables.

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7-17.2(2) PROOF TESTS (PREQUALIFICATION) (NEW SECTION)

The intent of this requirement is to pre-qualify a joint system, components of which meet the above requirements, as to the watertightness of that joint system. This proof test shall apply to all pipes which are to be tested for watertightness prior to acceptance. Materials and test equipment for proof testing shall be provided by the manufacturer. When approved by the Project Engineer, internal hydrostatic pressure may be applied by a suitable joint tester. See test requirements in the following Sections:

Joints COS 9-04

Pipe COS 9-05

7-17.2(3) MATERIAL CERTIFICATION (NEW SECTION)

The manufacturer or fabricator shall furnish a Manufacturer's Certificate of Compliance, based on Manufacturer's routine quality control tests that the pipe meets or exceeds the requirements of the pertinent ASTM or ANSI specification.

7-17.2(4) EXCAVATION AND PREPARATION OF TRENCH, PIPE BEDDING, AND CLAY DAM (NEW SECTION)

A. Trench Excavation

1. General Excavation Requirements

Trench width shall be according to COSP Number 284.

All ledgerock, boulders, stones, and any other object larger than 3 inch in any dimension shall be removed where within 6 inches in any direction of the pipe. The maximum size of aggregate within 6 inch of the pipe shall not exceed 1 inch per foot of pipe diameter and in no case shall exceed 3 inch.

Prior to installation of bedding and pipe, the trench bottom shall be brought to grade as indicated in the Contract for the type of bedding specified and if the trench bottom is disturbed, compacted to 90% as specified in COS Section 2-03.3(14)E for a one (1) foot depth to provide a foundation capable of supporting the pipe in its proper position. Bedding and backfill material shall be placed as indicated on COSP numbers 285 and 284, or Special Trench Section per Plans. Where Class D bedding is specified in the Contract, additional trench bottom preparation shall comply with COS Section 7-17.3(1)B.

Excavation for manholes and other Structures connected to the pipelines shall be sufficient to provide a minimum of 12 inches between the side surface of the Structure and the sides of the excavation.

All material excavated from trenches and piled adjacent to the trench shall be piled and maintained so that the toe of the slope is at least 2 feet from the edge of the trench. This

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material shall be piled to cause a minimum of inconvenience to public travel, and provision shall be made for traffic where necessary. Clear access shall be provided to all fire hydrants, water valves, and water meters. Surface drainage and runoff along gutters to storm drain facilities and along natural watercourses shall not be blocked. See COS Section 1-07 for other requirements.

The Contractor shall remove any support system or shield system or related system in such a manner as to not disturb bedding and backfill. Where bedding or backfill is disturbed, the Contractor shall reconsolidate these materials to specified requirements.

The Contractor shall be required to provide monitoring during excavation associated with the construction of pipes and trenches adjacent to existing structures. Monitoring means and methods for Boeing structures shall be at the Contractors discretion but shall be able to report peak particle velocity and demonstrate at least three readings spanning the duration of construction activity each day. The Contractor shall take photographs of the existing structures and give to the Project Engineer prior to beginning excavation documenting existing cracks, settlement, and building conditions. At no time shall construction activities exceed a peak particle velocity of 0.75-inches per second.

2. Extra Excavation

When, after excavating to the specified foundation level, if the material remaining in the trench bottom is determined unsuitable by the Project Engineer, then excavation shall be continued to such additional depth as directed by the Project Engineer.

All additional excavation directed by the Project Engineer or indicated in the Contract which is beyond neatline limits indicated on COSP numbers 284 and 285 will be considered “Shoring or Extra Excavation Cl B”.

Where foundation material is required, it shall consist of Mineral Aggregate Type 2, Project Engineer specifies otherwise.

3. Dewatering

During excavation, installation of pipeline, and placement of bedding and trench backfill, excavations shall be kept free of water. The Contractor shall control surface runoff so as to prevent entry or collection of water in excavations. The static water level within the excavation shall be drawn down a minimum of 1 foot below the bottom of the excavation so as to maintain the undisturbed state of the foundation soils and allow acceptable placement of any bedding or backfill to the required density.

At least 10 working days before dewatering is started, The Contractor shall submit to the Project Engineer, the method and installation including details of the dewatering system as necessary, indicating number and type of equipment and pipelines including capacity(ies), dewatering pits and locations, water discharge locations, an estimate of advance time to dewater the trench prior to work in the trench when necessary, filter

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systems and locations as necessary, and such other information to verify acceptable control and performance. Open and cased sumps shall not be used as primary dewatering for excavations deeper than 3 feet below the static water table.

The Contractor shall furnish, install and operate all necessary equipment to keep excavations free from water during construction. The control of groundwater shall prevent softening of the bottom of excavations or formations of "quick" or heaving conditions, or "boils". Dewatering systems shall be designed and operated so as to prevent any removal or flowing of native soils. Contaminated water shall be contained and treated prior to discharge. Disposal of water shall not cause injury to public or private property or nuisance to the public. Sufficient pumping and power equipment in good working condition shall be available at all times for all emergencies, including power outage, and competent workmen shall be available at all times for the operation of the dewatering.

The dewatering system shall be designed to prevent loss of foundation support to adjacent structure, underground installation, improvement, or the sides of an excavation.

The dewatering system shall be designed to prevent loss of foundation support to adjacent structure, underground installation, improvement, or the sides of an excavation.

The dewatering system shall be installed and operated so that the groundwater level outside the excavation is not drawn down to the extent that would damage or endanger adjacent structure, underground installation, sidewalk, pavement, other improvement, or property.

The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils and supported soils, prevent disturbance of compacted bedding and backfill, and prevent floatation or movement of Structures, pipelines, Sewers, and Storm Drains.

All costs associated with dewatering and treating the trench excavation and controlling groundwater shall be included in the various Bid items and no separate or additional payment will be made therefore.

The Contractor is fully responsible for controlling groundwater.

4. Unexpected Objects

Unexpected objects, such as stumps, railroad ties, buried pavements, pile, abandon footings and foundations, abandon utilities, contaminated waste, etc., encountered in the trench excavation shall be removed and disposed of by the Contractor. Removal of unexpected objects will be considered included in pipe installation Work unless one or more of the following conditions are met:

The object(s) cannot be removed by the equipment or excavation method at hand; or

The trench width or depth must be increased.

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In the event the Contractor meets condition 1 or condition 2 or both conditions listed immediately above, removal of the object will be paid in accordance with Section 1-04.7.

5. Vacant

6. Vacant

B. Pipe Bedding

1. General

Bedding of the class or classes shown on the Plans, shall be installed in accordance with COSP number 285, and shall include all of the materials and work within the limits of the bedding zones indicated on COSP number 285.

Unless otherwise specified in the Contract, bedding for rigid and flexible pipe shall be Class B except bedding for ductile iron shall be Class D.

All classes of bedding shall provide uniform support along the entire barrel, without load concentration at joint collars or bells. No blocking of any kind shall be used to adjust the pipe to grade except when used with embedment concrete. Bell holes shall be excavated as required to ensure uniform support along the pipe barrel. Bedding disturbed by pipe movement or by removal of shoring or movement of a trench shield or box shall be reconsolidated prior to backfill. Special care shall be taken to provide adequate bedding support at wye or tee connections and adjacent to manholes or other Structures, so as to avoid bending or shearing stresses at these critical points.

2. Bedding for Rigid Pipe

Bedding shall be Class A, Class B, Class C, Class D, and Class Special. The requirements and limits for the various classes of bedding are as shown on COSP number 285 and are described as follows:

a. Class A Bedding: Concrete for class A bedding shall be Class 5 (1-1/2) per COS Section 5-05.3 and shall be a 4 sack minimum Portland cement concrete mix with 1-1/2 inch maximum size aggregate. When placing the concrete bedding, the pipe shall be prevented from floating. Concrete shall be allowed to cure for a minimum of 12 hours prior to placing the Type 9 Mineral Aggregate bedding material. Mineral Aggregate bedding shall be placed in lifts of not more than 6 inches to a point 6 inches above the top of the pipe. Compaction of Mineral Aggregate Type 9 shall be to 90% as specified in COS Section 2-03.3(14)E. Before beginning work on concrete bedding, the Contractor shall submit a mix design for 1-1/2 inch maximum size aggregate concrete with a 28 day strength of 4,000 psi to the Project Engineer for approval at least 5 working days in advance of starting work. It shall have a sufficient fluid consistency to readily fill all voids around and under the pipe.

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b. Class B Bedding: Class B bedding of Type 9 Mineral Aggregate shall be placed in at least 3 lifts. The first lift shall be placed before the pipe is installed and shall be a minimum of 4 to 6 inches in thickness (see dimension "A" on COSP number 285). The material shall be spread smoothly so that the pipe is uniformly supported along the barrel. Subsequent lifts of not more than 6 inches shall be brought up to a point 6 inches above the top of the pipe. Each lift shall be brought up on both sides of the pipe and shall be carefully worked under the pipe haunches by means of slicing with a shovel, vibration or other procedures approved by the Project Engineer. Compaction of bedding shall be to 90% maximum dry density as determined by methods specified in COS Section 2-03.3(14)E.

c. Class C Bedding: Requirements for Class C bedding shall be the same as for Class B except that the Type 9 Mineral Aggregate shall extend only to the springline of the pipe. Selected native material shall then be placed in 6 inch lifts to 6 inches above the pipe bedding, using the same methods as those required in Class B bedding. Compaction of Mineral Aggregate Type 9 shall be to 90% maximum dry density as determined by methods specified in COS Section 2-03.3(14)E. Compaction of native material shall be as specified in COS Section 7-17.3(3).

d. Class D Bedding: Class D bedding shall be attained by carefully excavating the trench to proper grade, overexcavating at bell sections, and placing and compacting selected material around the pipe. Class D bedding and backfill shall be in accordance with COS Section 7-17.3(3).

e. Class Special Bedding: Bedding Cl Special shall be excavated according to COSP number 284 and details in the Plans. Bedding Cl Special shall include all materials, tools, labor, and hauling to construct the trench with the materials shown in the Plans. Over excavation may be necessary to stabilize the trench and shall be included in Bedding Cl Special.

Where authorized excavation has been made below the established grade, the Contractor shall provide, place, and compact suitable bedding material to the Proper grade and elevation. If the Project Engineer substitutes imported Mineral Aggregate Type in lieu of the selected native material shown for Class C and for Class D bedding on COSP 285, the bedding will be measured and paid for as Bedding, Class B, (Size) Pipe".

3. Bedding for Flexible Pipe

All references to this Specification Section regarding Water Main trench excavation shall make reference to COSP 350, and Water Main reference to COSP numbers 284 and/or 285 shall be interpreted as reference to COSP number 350.

Bedding for flexible pipe shall be Class B bedding with Mineral Aggregate Type 22 placed in several lifts in accordance with COSP 285. Before installing the pipe, a first bedding lift of 6 inch thickness, depending on pipe size, shall be placed. Then the pipe is installed. The bedding shall be spread smoothly so that pipe is uniformly supported

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along the barrel. Subsequent lifts of not more than 6 inches thickness shall be installed to the crown of the pipe and individually compacted to 90%. A further 6 inch lift of moderately compacted material shall be placed over the crown of the pipe in a manner not to crush or disturb the pipe.

4. Clay Dam

Clay dam shall be as specified in the Contract. Clay dam shall be controlled density fill material or other suitable material with the Project Engineers approval. The Clay dam shall be of sufficient height, width, depth, and thickness to prevent water seepage within the utility, storm sewer, or other underground trench section.

7-17.2(5) INSTALLING SEWER PIPE (NEW SECTION)

A. Survey Line and Grade

Pipe shall be installed to the true line and grade indicated in the Contract at the invert of the pipe. The limit of variance at the invert shall not exceed plus or minus 0.03 feet from true line and grade at the time of backfill, and in no case shall result in reverse flow or have a sag. Checking the invert of the pipe may be made by calculations from measurements on the top of the pipe.

The Contractor may use any method, such as swede line and batter board", laser beam, etc., which would allow accurate transfer of the control points provided by the Project Engineer to installing the pipe to the designated alignment and grade.

When using the "swede line and batter board" method, the Contractor shall transfer line and grade into the trench where they shall be carried by means of a taut grade line supported on firmly set batter boards at intervals of not more than 30 feet. Not less than three batter boards shall be used at one time. Grades shall be constantly checked and in the event the batter boards do not line up, the work shall be immediately stopped, the Project Engineer notified, and the cause remedied before proceeding with the Work.

When using a laser beam to set pipe alignment and grade, the Contractor shall constantly check position of laser beam from surface hubs provided by the Project Engineer to verify laser beam alignment and grade. In the event the laser beam is found out of position, the Contractor shall stop work and make necessary corrections to the laser beam equipment and to pipe installed.

B. Pipe Installation and Jointing

1. Pipe Installation

After an accurate grade line has been established, the pipe shall be installed in the properly dewatered trench. Mud, silt, gravel, and other foreign material shall be kept out

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of the pipe. Pipe joints shall be kept clean and protected at all times, and shall be lubricated as recommended by the pipe manufacturer before joining.

All pipe installed in the trench shall be kept in longitudinal compression until the bedding has been placed and compacted around and over the pipe.

The Contractor shall exercise care in matching pipe joints for concentricity and compatibility. In no case shall two pipes be joined together with ends exceeding the maximum manufacturer's tolerance.

The pipe shall be installed in the up-grade direction from the point of connection from either the existing pipe or the designated structure as a starting point. The pipe shall be installed with the bell end forward or upgrade.

When pipe installation is not in progress, any open end of the pipe shall be sealed with an approved temporary watertight plug.

2. Joints-Hand Mortared and on Curves

Where pipelines are to be installed on specific curves of sufficiently short radius to deflect the pipe joints in an amount greater than recommended by the pipe manufacturer, the curves shall be achieved with a series of tangents and shop-fabricated bends complying with the pipe manufacturer's recommendations as approved by the Project Engineer. The Contractor shall submit the manufacturer's recommendation for approval at least 5 working days in advance of starting work. Pipe inverts shall comply with the requirements of Section 7-17.2(5)A.

Hand mortared pipe joints will not be allowed. All joints shall be watertight and meet the applicable test requirement(s) of Section 7-17.3(4).

See Section 7-17.2(5)E for gasketed jointing.

C. Plugs and Connections

1. General

All fittings shall be capped or plugged with an approved material as the pipe unit; or shall be fitted with an approved mechanical stopper; or shall have an integrally cast knock-out plug. The plug shall be able to withstand all test pressures without leaking, and when later removed, shall permit continuation of piping with jointing similar to joints in the installed line.

Should testing or television inspection indicate installed pipe is damaged or does not pass testing, the Contractor shall remove and replace the failed or damaged section of the pipe. Should the Contractor believe the pipe which is damaged, or which failed the test, can be repaired by other than remove and replace, the Contractor shall submit a repair method for approval by the Project Engineer at least 5 working days in advance of starting work. The replaced, or repaired pipe, shall again be inspected and tested. Repairs using rubber

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boot type methods, such as FERNCO type coupler repairs, will not be allowed unless approved otherwise by the Project Engineer. See Section 7-17.3(4).

2. Fittings

Unless otherwise specified in the Contract, tee fittings shall be provided in the Sewer and Storm Drains for side Sewers, catch basin connections, and service drains. Tees shall be 8 inches inside diameter, except tees for side Sewers shall be 6 inches inside diameter unless indicated otherwise in the Contract. All fittings shall be of sufficient strength to withstand all handling and load stresses normally encountered. All fittings shall be of the same material as the pipe, except when core drilling to insert a tee, which shall be per Section 7-17.2(5)C3. Material joining the fittings to the pipe shall be free from cracks and shall adhere tightly to each joining surface. Fittings shall make for a watertight connection meeting the requirement(s) of Section 7-17.3(4).

All tees on new pipe less than 24 inch inside diameter shall be prefabricated.

3. Cut-In Tee On Existing Or New Pipe

The Contractor shall locate and cut a hole in the existing or new pipe centered at 30 to 45 degree angle to the springline. Springline is defined as the widest cross-section of the host pipe measured horizontally. Coring shall be done such that the cored out piece or other materials do not drop into the pipe. The Contractor shall notify the Project Engineer at least 2 working days in advance of cut-in tee operation.

Coring shall be performed in accordance with the following:

a. Concrete Pipe Tees To Concrete Pipe: A concrete tee may be installed on an existing concrete pipe 18 inches in diameter or larger by placing a short length of concrete pipe into the core-drilled hole with its bell end against the outside face of the pipe and the barrel end inserted just to the inside face of the pipe. The end against the outside face of the pipe and the barrel end inserted just to the inside face of the pipe. The Contractor shall thoroughly clean the bonding areas between the tee and the pipe so that the surfaces are free of dirt, dust, grease, oil or other contaminants that may reduce the bond between the grout and the pipe surfaces. Both surfaces shall first be coated with a concrete bonding agent submitted for review and accepted by the Project Engineer. The annular space between the tee and the core-drilled surfaces shall then be tightly packed with non-shrink cement sand grout meeting the requirements of COS Section 9-04.3(2). The connection shall be neatly finished inside and outside the existing concrete pipe.

b. Ductile Iron Tee to Existing Connection Pipe: The existing concrete pipe shall be core-drilled with a hole large enough to accommodate the barrel of the specified size of ductile iron pipe and provide a 1 inch space between ductile iron pipe and the existing concrete pipe for application of grout. A length of ductile iron pipe shall be cut so that it can be placed in the core-drilled hole with its bell end against the outside

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face of the existing pipe without the barrel protruding beyond the inside face of the existing pipe. The Contractor shall clean the outside of the ductile iron pipe, removing loose particles (dust, dirt, oil, or film of any sort) that may reduce the bond between the grout and the pipe. After core drilling, the exposed surface of the existing concrete pipe shall be rough and clean. Both surfaces shall be coated with a bonding agent submitted for review and approval by the Project Engineer. The annular space between the pipe and core drilled surfaces shall be tightly packed with non-shrink cement sand grout meeting the requirements of COS Section 9-04.3(2). The connection shall be neatly finished inside and outside the existing concrete pipe.

c. Vacant

d. Vacant

e. Insert a Tee to Clay Pipe: The Contractor shall submit the method and type tee recommended by the tee manufacturer to the Project Engineer for approval at least 5 working days in advance of starting work.

f. Insert a Tee to Concrete Pipe: The Contractor shall core drill a full size hole in one operation to accommodate a Project Engineer approved PVC tee insert with a coupling fitting.

All existing pipe, 18 inch and smaller diameter, made of non-reinforced concrete or vitrified clay shall be fully exposed for inspection.

The excavation shall be backfilled and compacted per Section 7-17.3(3).

The Contractor shall notify the Project Engineer at least 2 working days before beginning cut-in operations (Note – The Engineer will notify the SPU Drainage and Wastewater Division @ 206-386-1230 for the South District). The existing pipe shall be inspected by the Engineer for defects before the drilling or cutting operation starts, again during drilling or cutting operations, and after installation of the tee is completed to make certain that no defective parts or work remain undetected and uncorrected. If the Contractor has requested the Engineer to core drill the hole, the Contractor shall provide a tee made of the same material and with the same corrugations as the cored pipe.

If the exposed pipe is found cracked or deformed, the Engineer will arrange for either roll in of a new pipe, or repair of the damage at no cost to the Contractor, provided the damage was not caused by the Contractor's operations. If the Engineer rolls in a new pipe with a tee already on it, no fitting will be required.

D. Pipe Markings

On elliptically reinforced concrete pipe, the markings indicating the minor axis of the reinforcement shall be placed in a vertical plane (top or bottom) when the pipe is installed.

E. Gasketed Joints

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Pipe handling after the gasket has been affixed shall be carefully controlled to avoid disturbing the gasket and knocking it out of position, or contaminating it with dirt or other foreign material. Any gaskets so disturbed shall be removed, cleaned, replaced, and relubricated before joining the sections. Care shall be taken to properly align the pipe before joints are entirely forced home. During insertion of the tongue or spigot, the pipe shall be partially supported by hand, sling, or crane to minimize unequal lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned. Since most gasketed joints tend to creep apart when the end pipe is deflected and straightened, such movement shall be held to a minimum once the joint is home. Sufficient pressure shall be applied in making the joint to ensure that it is home, as described in the standard installation instructions provided by the pipe manufacturer. Sufficient restraint shall be applied to the line to ensure that joints once home are held so, until fill material under and alongside the pipe has been sufficiently compacted. At the end of the work day, the last pipe shall be blocked in an effective way to prevent creep. Where pipe must be deflected to accommodate required horizontal or vertical curvature, it shall first be joined in straight alignment and then deflected as required. See Section 7-17.2(5)B2 for hand mortar joints and joints on curved pipe.

F. Jointing – Break-Out And Reconnect & Mismatched Wall Thickness

Where it is necessary to break out or connect to an existing pipe, only new pipe having the same inside diameter shall be used in reconnecting the pipeline. Inverts, grade, and alignments are to match. Where joints must be made between pipes with a mismatched wall thickness, the Contractor shall use a flexible gasketed coupling, adapter or coupling-adapter to make a watertight joint. Couplings shall be those manufactured by “Romac”, “Smith-Blair”, or approved equal.

G. Storm Drain And Sewer Connections

Catch basin, service drain, or side Sewer connections to Sewer and Storm Drain trunks, mains, or laterals, shall be left uncovered until after the Engineer has inspected and approved the Work. After approval of the connection, the bedding and trench backfill work shall be completed.

H. Vacant

I. Protection Of Existing Sewer Facilities

All existing live Sewers including septic tanks and drain fields shall be kept in service at all times. Provision shall be made for disposal of sewage flow if any existing Sewer is damaged. Water accumulating during construction shall be removed from the new pipeline but shall not be permitted to enter the existing system. The Contractor shall be responsible for flushing out and cleaning any existing pipeline into which gravel, rocks, or other debris has entered as a result of his/her operations, and shall repair lift stations or other facilities damaged by his/her operations. The physical connection to an existing manhole or pipeline shall not be made until authorized by the Project Engineer. Such authorization will not be given until all

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upstream lines have been completely cleaned, all debris removed and, where applicable, a pipe has been temporarily placed in the existing channel and sealed.

J. Vacant

K. Temporary Sewer Bypass

The Contractor shall install a temporary bypass to maintain uninterrupted Sewer service on projects calling for reconstruction of existing Sewer mains or on projects where construction Work will interfere with sewage flow in the existing Sewer. The bypass shall be made by diverting the effluent flow at an upstream access manhole and pumping it through a separate conduit to a downstream reentry point or to an adjacent Sewer system. The pump and bypass conduit shall be of adequate size and capacity to handle the flow. The effluent level in the bypass pumping manhole shall not be allowed to rise more than 1 foot above the crown of the incoming Sewer pipe.

A written proposal for bypassing the remaining portion of the Sewer system and the list of all equipment to be used for the Work shall be submitted by the Contractor to the Project Engineer, allowing at least 10 working days for review and return of comments. The Project Engineer's review shall not relieve the Contractor of its responsibilities or of any public liability for sewage spills under this Contract.

7-17.3(2)A GENERAL

The third paragraph is deleted and replaced with the following:

All wyes, tees, and stubs shall be plugged using test tees, or acceptable alternate, securely fastened to withstand the internal test pressure. Such test tees shall be readily removable, and their removal shall provide a socket suitable for making a flexible jointed lateral connection or extension.

7-17.3(2)B EXFILTRATION TEST

Section is deleted in its entirety and replaced with the following:

Prior to making exfiltration leakage tests, the Contractor may fill the pipe with clear water to permit normal absorption into the pipe walls, provided that after filling the pipe the leakage test is completed within twenty-four hours. When under test, the allowable leakage shall be limited according to the provisions that follow. Specified allowances assume pre-wetted pipe.

Leakage shall be no more than 0.28 gallons per hour ("gph") per inch inside diameter ("inch diam.") per 100 linear feet ("L.F.") of pipe, with a hydrostatic head of 6 feet above the crown at the upper end of the test section, or above the natural groundwater table at the time of test, whichever is higher. The length of pipe tested shall be limited so that the pressure at the lower end of the section tested does not exceed 16 feet of head above the invert, and in no case shall the length be greater than 700 linear feet or the distance between manholes when greater than 700 linear feet.

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Where the test head is other than 6 feet, the measured leakage shall not exceed 0.28 gph per inch inside diameter per 100 linear feet times the ratio of the square root of the test head to the square root of 6.

Leakage maximum = $0.28 \times \sqrt{H} / \sqrt{6} = 0.114 \times \sqrt{H}$, where leakage is in gph/inch dia/100 L.F..

When the test is to be made one joint at a time, the leakage per joint shall not exceed the computed allowable leakage per length of pipe.

An allowance of 0.2 gallons per hour per foot of head above invert shall be made for each manhole included in a test section.

All pipe and detention systems in, or near as indicated in the Contract, Environmentally Critical Areas designated geologically hazardous areas, shall require exfiltration testing. Approval will not be given unless the detention system passes this test. The Contractor shall notify the Project Engineer at least 5 working days in advance of proposed testing.

7-17.3(2)C INFILTRATION TEST

Section is deleted in its entirety and replaced with the following:

Infiltration test leakage shall not exceed 0.16 gallons per hour (gph) per inch inside diameter (inch dia) per 100 linear feet (L.F.) of pipe tested, when the natural groundwater head over the pipe is 2 feet or less above the crown of the pipe at the upper end of the test section. The length of pipe tested shall not exceed 700 linear feet or the distance between manholes when greater than 700 linear feet.

Where the natural groundwater head is more than 2 feet, the measured leakage shall not exceed 0.16 gph per inch inside diameter per 100 linear feet times the ratio of the square root of the natural groundwater head to the square root of 2.

Leakage maximum = $0.16 \times \sqrt{H} / \sqrt{2} = 0.114 \times \sqrt{H}$, where leakage is in gph/inch dia/100 L.F..

When a suitable head of groundwater exists above the crown of the pipe and when the pipe is large enough to perform work inside it, acceptance may be based on there being no visible leakage. Where leakage is indicated, the repair methods shall be submitted in writing to the Project Engineer by the Contractor for approval (see Section 7-17.3(4)A1).

7-17.3(2)E AIR PRESSURE TEST FOR SEWERS CONSTRUCTED OF AIR-PERMEABLE MATERIALS (NEW SECTION)

This section is deleted in its entirety along with the title and replaced with the title above and the following:

Vitrified clay pipe shall be air tested as specified in COS Section 9-05.4. For all other pipe material:

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1. Pipelines may be tested with low pressure air by the pressure drop method, in lieu of water infiltration or exfiltration. The pressure drop shall be from 3-1/2 to 2-1/2 psi greater than the average back pressure of groundwater above the springline of the pipe. At the Contractor's option, pipe may be tested without pre-wetting; however, the test allowances herein assume pre-wetted pipe.

2. The allowable rate of air loss shall be .003 cubic feet per minute (cfm) per square foot of internal pipe surface; however, the total air loss shall not exceed 3.50 cfm.

3. The test equipment to be used shall be furnished by the Contractor and shall be inspected and approved by the Project Engineer prior to use. The Project Engineer may at any time require a calibration test of gauges, other instrumentation, and equipment that is used for this test.

4. Safety Provisions. Plugs used to close the Sewer pipe for the air test shall be securely braced to prevent the unintentional release or loosening of a plug. Gauges, air piping manifolds, and valves shall be located at the ground surface. No person shall be permitted to enter a manhole where a plugged pipe is pressurized. (Four pounds per square inch gauge (psig) air pressure develops a force against the plug in a 12 inch diameter pipe of approximately 450 pounds, and a plug failure may result in injury.) Air testing apparatus shall be equipped with a pressure release device designed to relieve pressure in the pipe at a pressure recommended by the pipe manufacturer. The Contractor shall submit the pipe manufacturer's recommendations to the Project Engineer including the safety precautions for pipe testing.

5. Pipe with inside diameter less than 36 inches may be tested from manhole to manhole or on shorter lengths at the Contractor's option. Pipe 36 inches in diameter and over shall have all joints tested individually and in consecutive order along the entire line. The void volume around the joint shall be pressurized to 3.5 psi above that of the average groundwater pressure above the springline of the pipe. The Contractor shall allow the air pressure and temperature to stabilize before shutting off the air supply and start of test timing. Joint or joints will be determined acceptable if a pressure loss not exceeding 1.0 psi occurs over a 30 second test interval. If a pipe joint fails to pass this pressure test or also fails a retest, it shall be repaired in a manner acceptable to the Project Engineer. If not repairable, the damaged pipe section shall be replaced with a new one and the joints tested as specified above.

7-17.3(2)F AIR PRESSURE TEST FOR PIPES CONSTRUCTED OF NON AIR-PERMEABLE MATERIALS

This section is deleted in its entirety along with the title and replaced with the following:

1. General

Vitrified clay pipe shall be air tested as specified in COS Section 9-05.4.

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For all other material pipe, when non air-permeable pipelines are subjected to the low pressure air test, all of the provisions of COS Section 7-17.3(4)D shall apply except that the pressure drop shall be from 3.5 to 3.0 psig greater than the average back pressure above the center of the pipe, and the minimum time shall be twice that computed as specified under COS Section 7-17.3(4)D.

2. Recommended Procedure For Conducting Acceptance Test By Pressure Drop Method COS Section 7-17.3(4)E2

   a. Plug all pipe outlets with suitable test plugs. Brace each plug securely.

   b. All gauge pressures in the test should be increased by the amount of groundwater pressure at the center of the pipe.

   c. Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 psig.

   d. After an internal pressure of 4.0 psig is obtained allow at least 2 minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.

   e. After the 2 minute period, disconnect air supply.

   f. When pressure has decreased to 3.5 psig, start stop watch. Determine the time in seconds that is required for the internal air pressure to reach 2.5 psig. This time interval should then be compared with the time required by Specification computed as follows.

   g. List size and length of all portions of pipe under test in table similar to the one that follows. The maximum reach to be tested in one operation shall be the reach between two consecutive manholes.

   h. By the use of Nomograph, compute K and C. Use scales d and L, read K and C, and enter these values in the table.

   i. Add all values of K and all values of C for pipe under test.

   j. If the total of all C values is less than one, enter the total of all K values into the space for “Time Required by Specification”.

   k. If the total of all C values is greater than one and less than 1.75, divide the total of all K values by the total of all C values to get t_q.

   l. If the total of all C values is greater than 1.75, divide the total of all K values by 1.75 to get "Time Required by Specification" t_q.

Diameter Inches	Length (Feet)	K=0.0111dL	C=0.0003918dL

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		Total K=	Total C=
Time required by Specification (t_q)=			

t_q = Time required by specification
d = Diameter of pipe in inches
L = Length of pipe in feet

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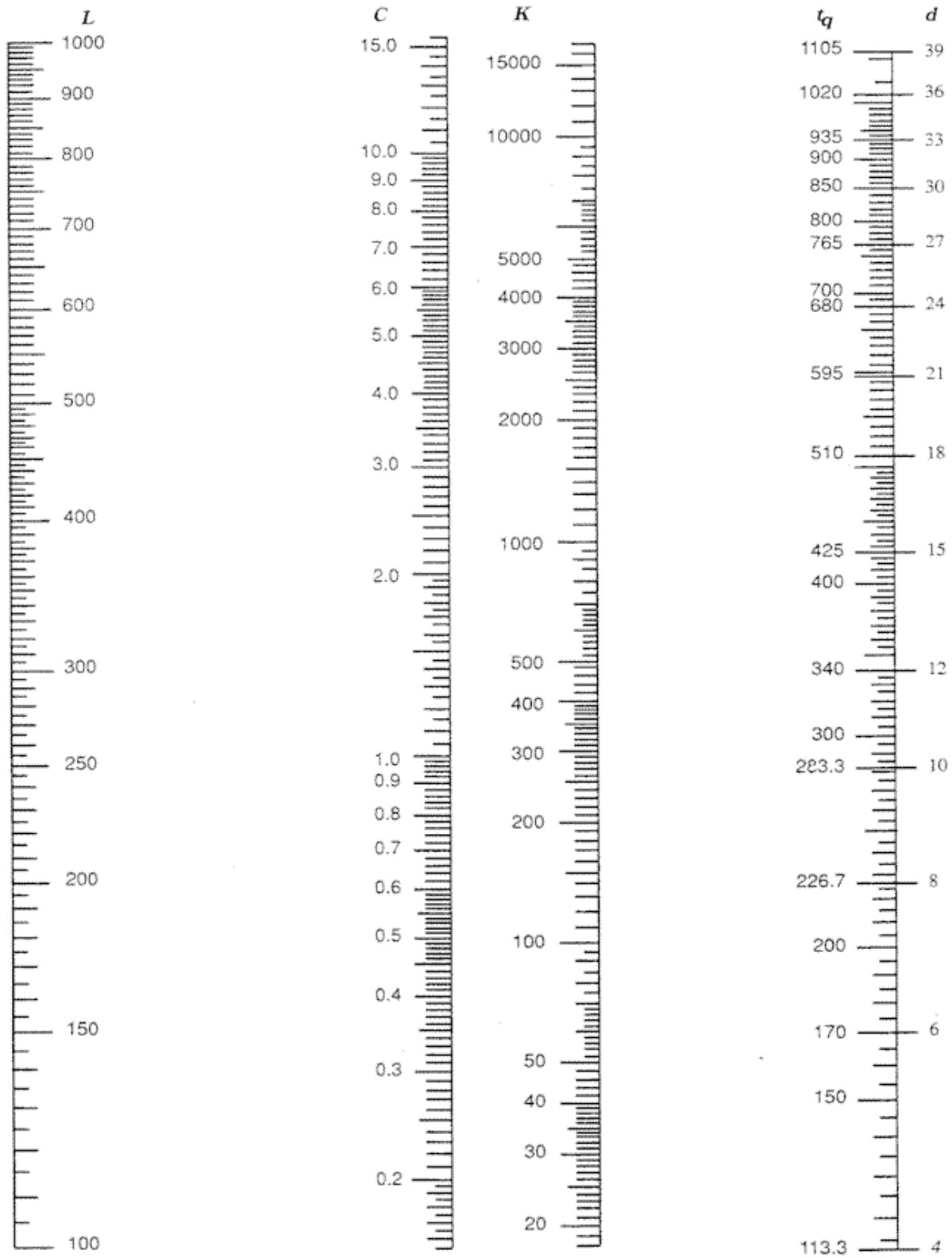
L
1000
900
800
700
600
500
400
300
250
200
150
100
C
15.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
K
15000
10000
5000
4000
3000
2000
1000
500
400
300
200
100
50
40
30
20
t_q
1105
1020
935
900
850
800
765
700
680
595
510
425
400
340
300
283.3
226.7
200
170
150
113.3
d
39
36
33
30
27
24
21
18
15
12
10
8
6
4

1

NOMOGRAPH for the solution of K = 0.011d2L, C = 0.0003882dL, t_q = K/C
See COS Page 7-52.

7-17.3(2)G DEFLECTION TEST FOR THERMOPLASTIC (FLEXIBLE) PIPE

This section is deleted in its entirety and replaced with the following:

For pipes nominally 24-inch and larger inside diameter, deflections shall be determined by a method submitted to and approved by the Project Engineer. If a mandrel is selected, the minimum diameter, length and other requirements shall conform to the dimensions and requirements in this Specification.

All Sewer and Storm Drain constructed of flexible pipe shall be tested for vertical deflection no less than 30 calendar days after trench backfill and compaction have been completed. No diameter of the installed pipe shall exceed a tolerance of more than 5 % for 12 inch and smaller nominal diameter pipe, and by no more than 3% for all larger than 12 inch nominal diameter pipe and less than or equal to 30 inch nominal diameter pipe. For pipes less than or equal to 30 inches nominal diameter, a mandrel shall be pulled through the pipe by hand to ensure that the maximum allowable deflection has not been exceeded. Prior to use, the mandrel shall be measured, inspected for roundness, and certified as being sound and accurate. A Manufacturer's Certificate of Compliance stating the mandrel to be used meets these Specifications, shall be submitted to the Project Engineer at least 1 working day prior to the test. The use of an uncertified mandrel or a mandrel altered or modified after certification will invalidate the test, and a 2 working day advance notification to the Project Engineer of a retest with a certified mandrel shall be complied with. If the mandrel fails to pass through the pipe, the pipe will be deemed over deflected and unacceptable.

Testing shall be conducted on a manhole-to-manhole basis after the line has been thoroughly flushed with water. If testing reveals an over deflected pipe, it shall be uncovered and, if not damaged from over deflection or from excavation activities, the pipe may be corrected and reinstalled. If the pipe requires repair, the Contractor shall submit the proposed repair to the Project Engineer for approval at least 3 working days before making the repair. The Contractor shall also provide prior to performing the repair, a Manufacturer's Certificate of Compliance stating that the over deflected pipe as repaired shall acceptably perform as required by the Specifications. If no repair is recommended, the Contractor shall state that the pipe requires no repair including the reason why the pipe requires no repair, and shall also provide a Manufacturer's Certificate of Compliance stating that the pipe without repair shall acceptably perform as required by the Specifications. Any pipe damaged beyond reasonable repair, due to over deflection or from any other cause, shall be uncovered and removed from the Project Site and replaced with a new pipe at no cost to the County. Pipe large enough for a person to work inside it may be accepted on the basis of direct measurements rather than using a mandrel. The Contractor shall submit a method for making deflection measurements including the measurement device(s), how the measurement device(s) is verified as providing reasonably repeatable results, how "mark points" will be placed on the pipe for the deflection measurements, and how the measurement data at each test location is presented to demonstrate that any indicated deflection is within the tolerances allowed. The Project Engineer reserves the right to

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determine the number of measurements and the orientations of each measurement at each test location. The minimum number of orientations per test location shall be 3 in equal angle projections (3 orientations at 0°, 60°, and 120°). The Project Engineer also reserves the right to determine the number of test locations. The minimum number of test locations on any single section of pipe shall be no less than 2, and in no case shall there be less than 3 pipe sections tested, and no less than 3 pipe sections tested per any 100 foot length of pipeline.

The mandrel shall:

1. Be a rigid, nonadjustable, odd-numbering-leg (9 legs minimum) mandrel having an effective length not less than its nominal diameter;

2. Have a minimum diameter at any point along the full length as follows:

Minimum Mandrel Diameter (inches)	**Pipe Material**	**Nominal Size (inches)**
5.619	PVC ASTM D 3034 (SDR 35)	6
7.524		8
9.400		10
11.910		12
13.849		15
16.924	PVC ASTM F 679 (T-1 Wall)	18
19.952		21
22.246		24
25.290		26
28.502		30

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3. Be fabricated of steel, be fitted with pulling rings at each end, be stamped or engraved on some segment other than a runner indicating the pipe material, material specification, nominal pipe size, and mandrel OD (e.g., PVC, ASTM D 3034, 8 inch, 7.524 inch); and be furnished in a suitable carrying case labeled with the same data as stamped or engraved on the mandrel.

7-17.3(2)H TELEVISION INSPECTION

The following is added at the end of this section:

Once during the final inspection process and after all manholes have been rechanneled, the Contractor in the presence of the Project Engineer, shall television inspect the interior of all mainline Sewer and Storm Drain pipe 6 inches through 48 inches in diameter to determine acceptance of this portion of the Work. Pipe larger than 48 inches in diameter will be inspected visually by the Project Engineer after cleaning and successful testing by the Contractor. Side Sewer, catch basin and inlet connection pipe, and other non-mainline pipe will not require television inspection.

Personnel Qualifications: Personnel performing television inspection shall have completed the Pipeline Assessment and Certification Program (PACP), and shall have adequate experience and working knowledge of the entire television inspection systems and processes. Contractor shall submit said certification to the Project Engineer at least 3 working days in advance of the first television inspection.

Camera Equipment: The camera shall be a 360-degree radial view color television camera (also known as "pan and tilt") with a mechanical footage counter calibrated to indicate video footage consistent with distance traveled in the pipe.

Footage shall be zeroed at centerline structure (manhole, vault, etc.) where the video begins and footage shall increase as it travels forward, and decrease when backward camera movement is required. Footage shall be displayed on the video recording and be mentioned on the audio portion (see “audio commentary on recording”).

Light Source: The camera shall have a light source providing adequate illumination to clearly identify invert, crown, joints, sides, connections, infiltration/exfiltration, and as may be necessary. Illumination shall be Capable of providing adequate illumination to at least 15 feet in front of the light.

Camera travel in the pipe: The camera shall travel along the invert of the pipe invert to provide the best view of the crown, invert, connections and sides of the pipe, and shall travel at a speed no faster than 30 feet per minute.

Audio commentary on recording: Commentary shall be objective and shall be based on PACP defined assessment conditions. Audio shall be intelligible and shall be as free from interference and background noise as can reasonably be done.

Subjective comment (such as “the fault of”, “caused by”, and opinion, etc.) shall not be used. Comment shall include the footage location of the comment. At each of connections, the beginning structure, the ending structure, indicated flaws, areas of infiltration/exfiltration, open joints, outfall, and at other features as may be necessary, the footage location shall be mentioned on the audio.

Required Labeling on recording and in audio commentary: Each recording shall have audio accompaniment and shall address a single run of pipe between two (2) structures (manholes, vaults, or ending in an outfall, etc.) on a single recording

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Where relatively short runs exist (defined as 100 or fewer feet between centerlines of structures, or to end of outfall), more than one run may be allowed on a single recording when approved by the Project Engineer at least 3 working days in advance of starting work. The recording shall contain a legible label that clearly states the following, and the audio commentary shall begin with the following:

a. Date and time of day television inspection performed;

b. Names of television inspection crew members;

c. Project name, vault plan number listed on the Plans, and Plan sheet number;

d. Location with structure labels (for example – manhole 25, vault 2, outfall, etc.), camera travel direction, size of pipe, pipe material (such as "Broad Street, 5th Ave west to midblock, manholes 24 to 25, going downstream, 24 inch reinforced concrete pipe"); and

e. a unique identification number, with these numbers being in consecutive sequence on all videotapes of project pipe. If more than one run is on a recording, such information shall clearly be shown on the label and stated on the audio accompaniment.

Recording quality and characteristics : Television inspections shall be on compact discs (CD). If CD not possible or compatible with camera equipment or system, then a Standard Grade, 60-minute VHS tapes taped at SP speed, shall be of a quality that completely and clearly shows that listed in "required extra inspection".

Recordings not meeting the requirements of this Specification will be determined to be defective work. Upon written notice by the Project Engineer, the Contractor shall promptly conduct a second television inspection meeting specified requirements, and shall submit a second recording at no additional or separate cost to the County.

Required Pre-Notification: The Contractor shall notify the Project Engineer at least 3 working days in advance of the first television inspection.

Pre television inspection preparation: The pipeline system to be inspected shall be successfully pressure tested and then flushed clean prior to beginning inspection. Television inspection shall be performed prior to allowing mainline flow into the pipe from upstream sources. Upstream bypass, when used, shall accommodate television inspection to afford full visibility of pipe inverts (see Section 7-17.2(5)K).

Required Extra Inspection: At all lateral connections, areas of indicated infiltration/exfiltration, open joints, indicated pipe deflection, defects of any kind, and as the Project Engineer may require, shall require the camera to slow down and fully focus on such areas including having the camera slowly travel backward and forward for multi-directional views. Said areas shall require focused video inspection of not less than 5 seconds. Cameras with telescoping ability shall view

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the area by telescoping in and out as appropriate for the Project Engineer to evaluate the condition with certainty.

Reinspection: Should television inspection reveal defective work, the Contractor shall, upon written notice from the Project Engineer, correct said defects. An additional television inspection ("reinspection") shall then be taken of the corrected pipe run to verify the corrected pipe meets Specifications. Such reinspection shall be considered in accordance with Section 1-05.7.

Reverse travel runs : The Project Engineer may require a second television inspection including audio accompaniment run along a pipe by having the camera travel in the direction opposite the previous inspection ("reverse direction"). Such reverse inspection shall be on the same video tape with the footage counter beginning at the upper number and as the camera travels, decreasing in footage count. The audio portion shall include at the beginning of this reverse run, a statement to the effect that "a second view is about to begin of the same length of pipe in the reverse direction".

Temporary breakdowns: Should an occurrence such as camera breakdown or inability to perform as specified, or other condition arise where no camera or television or audio progress can be made, after the initial 30 seconds of such condition, the operator shall make comment on the audio of such condition and the footage location, then shall shut down the camera and the audio. Upon fixing such a condition, the video and audio shall be restarted and the audio shall include a comment to the effect _____condition fixed and video and audio restarting at _____footage location.

Contractor to provide: Compact disc shall be furnished to the Project Engineer within 10 working days of each television inspection, and shall become the property of the Project Engineer. The Project Engineer may agree to other arrangements. Additional television inspection: Six to eleven months after the Physical Completion Date, the pipes may, at the option of the Project Engineer, be television inspected again. Videotaping may be done by Owner's forces or, at the Project Engineer's option, by the Contractor. The Contractor shall schedule such inspection within 10 working days after the date of written notice by the Project Engineer. The audio portion on this recording shall indicate the same information as specified in "Required Labeling on recording and in audio commentary" also stating "this is an additional television inspection". This additional inspection will then be compared with the prior recording to determine whether or not any change has occurred in the condition of the pipe. Should there be evidence of changed conditions that warrant correction, the Contractor shall, upon written notice of the Project Engineer, correct those defects pursuant to Section 1-05.10. After the necessary corrections have been made by the Contractor, the corrections shall be verified in compliance with the Contract at the Contractor's sole expense.

7-17.3(3) BACKFILLING TRENCHES (NEW SECTION)

A. General

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In backfilling the trench, the Contractor shall take all necessary precautions to protect the pipe from any damage or shifting. The Contractor shall backfill from the side of the trench to a uniform depth of 2 feet above the crown of the pipe, including the bedding, before starting compaction. See COS Section 7-17.3(3)B for Compaction Requirements. During all phases of the backfilling operations and testing as outlined herein, the Contractor shall protect the pipe installation, provide for the maintenance of traffic as may be necessary, and provide for the safety of property and person. The Contractor shall use suitable native excavated material for trench backfill unless notified by the Project Engineer that the native material is unsuitable. The Project Engineer will examine excavated native material at the time of excavation to determine its suitability for use as backfill. Native material will be considered suitable for trench backfill if it is:

1. Capable of attaining the degree of compaction specified in COS Section 7-17.3(3)B;
2. Within reasonable tolerance of optimum moisture content; and
3. Reasonably free of organic material, clay, frozen lumps, rocks or pavement chunks more than 6 inches in maximum dimension, or other deleterious matter. Unsuitable backfill material shall be removed from the Project Site and replaced with Mineral Aggregate Type 17, selected material, or such other imported material as designated by the Project Engineer. The Contractor shall take any necessary steps to protect the excavated material from becoming contaminated with excessive moisture.

Where it is required that a blanket of selected material or bank run gravel be placed on top of the native backfill, the backfill shall be placed to such elevation as shown on the Plans, and shall be leveled to provide for a uniform thickness of the borrow material. Compaction shall be required. Pipe trenches shall be backfilled as soon as possible after the pipe installation. The Contractor shall not have more than 200 feet of trench open in which the pipeline has been completed, except by permission of the Project Engineer. Backfilling of trenches in the vicinity of catch basins, manholes, or other appurtenances will not be permitted until the cement in the masonry has become thoroughly hardened. Walking on the pipe shall not be allowed until at least 1 foot of backfill has been placed upon it. Should native material be contaminated or not suitable as backfill material, the Contractor shall provide suitable backfill material at the direction of the Project Engineer. Suitable backfill material shall be considered included in the unit bid items and prices and no separate payment shall be made.

B. Compaction of Trench Backfill

Trench backfill shall be spread in lifts and be compacted by mechanical tampers of the impact type approved by the Project Engineer. The backfill material shall be placed in successive lifts with the first lift not to exceed 2 feet above the pipe, and the following lifts not exceeding 12 inches in loose thickness, with each lift being compacted to the density specified as follows:

1. Improved areas such as street and sidewalk areas shall be compacted to 95% of maximum dry density; or

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2. Unimproved areas or landscape areas shall be compacted to 90% of maximum dry density.

Compaction control tests shall be performed as specified in COS Section 2-03.3(14)E.

The procedure and equipment to be used for backfill compaction shall be demonstrated on a test section of pipeline to be located by the Project Engineer at the beginning of this work. The Contractor shall make these arrangements with the Project Engineer at least 2 working days prior to beginning this work. The Contractor shall excavate test pits in the backfill as directed by the Project Engineer for the purpose of testing the backfill compaction.

If the required compaction density has not been obtained, the Contractor shall remove the backfill from the trench and recompact using heavier compaction equipment or more passes. This process shall be repeated until the Contractor has established a procedure that provides the required field density. The Contractor will then be permitted to proceed with backfilling and compacting the remainder of the pipeline under the approved compaction procedure. In the event routine field densities taken during the course of construction show the specified compaction of backfill is not being obtained because of changes in soil types which are identified as suitable by the Project Engineer, the Contractor will be required to reestablish the compaction procedure. In no case will excavation, backfill, and pipe installation operations be allowed to proceed until the specified compaction of backfill is attained. Water settling will not be allowed as a method for compaction of backfill.

7-17.3(4) CLEANING AND TESTING (NEW SECTION)

A. General

Pipelines and appurtenances shall be cleaned and tested, after backfilling, by the exfiltration or low pressure air method, at the Contractor's option, or by infiltration test if the groundwater table is such that the Project Engineer may require it.

All work involved in cleaning and testing pipelines between manholes or rodding inlets as required herein shall be completed within 15 working days after backfilling of pipelines and Structures. Any delay shall be submitted to the Project Engineer well in advance and requires the written consent of the Project Engineer. The Contractor shall furnish all labor, materials, tools, and equipment necessary to make the test, clean the lines, and perform all Work necessary thereto. The Contractor shall perform the tests in the presence of the Project Engineer. Precautions shall be taken to prevent joints from drawing apart during tests. Any damage resulting from these tests shall be repaired by the Contractor. The manner and time of testing shall be subject to approval by the Project Engineer.

1. Pipe Not Passing Testing

If any pipeline installation fails to meet the requirements of the test method used, or is indicated as defective by television inspection, the Contractor shall determine the source or sources of leakage and shall replace all defective pipe. Where the Contractor believes a

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repair can be made without removal, the Contractor shall submit to the Project Engineer for approval at least 5 working days in advance of starting work, the proposed repair. See COS Section 7-17.3(2)C1 for damaged connections or failed connections or plugs. The complete pipe installation shall meet the requirements of the test method used before being considered acceptable. Replacement or repair of defective pipe shall not commence until the Contractor has received approval of the method from the Project Engineer. Retest will be required for acceptance.

All lateral or side Sewer branches included in the test section shall be taken into account in computing allowable leakage.

Upon final acceptance of the Work, all Sewers, side Sewers and fittings shall be open, clean, and free draining.

7-17.4 MEASUREMENT

The following is added at the end of this section:

Bid items of Work completed pursuant to the Contract will be measured as provided in Section 1-09.1, Measurement of Quantities , unless otherwise provided for by individual measurement paragraphs herein this Section.

Measurements for "Pipe, (Use), (Material), (Class), (Size)", will be by the linear foot of pipe actually installed and successfully tested, and shall be along the centerline of the pipe through the tees or wyes with the exception of pipe ending at a tee or wye. Measurements will be to the center of new manhole or rechanneled existing manhole; or to the inside face of Structure or existing manhole not rechanneled; or to the end of pipe where it meets a manhole stub; or to a wye, or to a tee whether with stub or cut-in. Measurement will be to the nearest 0.1 foot (See COSP number 010). All incidentals to Sewer and Storm Drain pipe measurement will be measured within COSP number 284 neatlines, and for Water Main will be measured within COSP number 350 neatlines.

Measurement for "Television Inspection" will be for the linear feet of installed 6" - 48" diameter mainline pipe videotaped once during (1) final inspection and (2) such re-videotaping done six to eleven months after the Physical Completion Date. Measurement will be made along the pipe centerline through tees from (1) center to center of new or rechanneled manholes, or (2) to the inside face of Structures or manholes not channeled, or (3) to the end of pipe where it dead ends beyond manholes.

Temporary Schedule A (SIZE) In. Diam. Storm Sewer Pipe per linear foot shall include excavation, backfilling, temporary connections, and plugging and patching for the length installed.

Bid items of Work completed pursuant to the Contract will be measured as provided in [Section 1-09.1], Measurement of Quantities, unless otherwise provided for by individual measurement paragraphs herein this Section.

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Measurement for “Bedding, (Class), (Size) Pipe” and for “Bedding, CDF, (Size) Pipe” for Sewer, Culvert, and Storm Drain as shown on COSP number 285, and for Water Main as shown on COSP number 350, will be by the linear foot of pipe actually installed. For Sewer and Storm Drain, measurement will be from center to center of standard manholes and other Structures. For Water Main, measurement will be to inside face of Structure, to end of pipe, or to centerline of connecting tee.

Class D bedding will not be measured. Bedding beyond neatlines shown on the Standard Plans will not be measured.

No measurement will be made for trench backfill, Gravel Backfill for Foundation Cl B, and selected material for trench backfill, except for foundation material, for extra excavation, and for non-native and non select backfill material including CDF.

Gravel backfill for foundation Class B required for drainage related catch basins, manholes, and vaults shall be considered included in the unit bid item for the structures per each.

Measurement for foundation material will be by the cubic yard of Mineral Aggregate required to fill the void made by extra excavation and shall be based on neat line width of trench and depth and length as computed by the Project Engineer.

Measurement for Controlled Density Fill will be by the cubic yard of material actually placed for pipe bedding or trench backfill.

Measurement for shoring will be measured as specified in Section 2-09.4.

Measurement for Coated Steel Casing (Size) and (Size) In. Thick will be per linear foot.

Measurement for Temporary Sewer Bypass will be per lump sum and include all costs to mobilize, provide necessary pumps, full operating costs, monitoring, 24-hour service permits and personnel to bypass sewer service and no separate payment will be made.

7-17.5 PAYMENT

The following is added at the end of this section:

“Pipe, (Use), (Material), (Class), (Size)”, per linear foot.

The unit Contract price for “Pipe, (Use), (Material), (Class), (Size)” shall include all costs for the Work required to furnish and install the pipe of the type and size specified, and including the following:

a. trench excavation (except “Shoring or Extra Excavation”); haul, stockpile, backfill, and compact suitable native material backfill,

b. handling; hauling, storage, removal; off-site disposal of excess suitable and unsuitable excavated native material, or hauling, storage, placement of suitable excess excavated native material or selected material elsewhere on the project except where designated for embankment construction,

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c. dewatering of the trench,

d. required trench excavation, backfill, and compaction,

e. cleaning and testing per COS Section 7-17.3(4),

f. Class D bedding,

g. pipe coupling, and

h. removal and disposal of existing pipe within trench neatline limits when pipe replacement is called for in the Contract.

All costs in connection with excavating test pits and for standby time during field density tests for compaction shall be considered as included in the Bid item prices for the applicable pipe Bid items. Unauthorized excavation below the established trench grade shall be made good by the Contractor at the sole expense of the Contractor by providing, placing and compacting suitable bedding material to the proper grade elevation.

The work of cleaning and testing, except Television Inspection, and furnishing caps and plugs for the tests shall be considered as included in the unit Contract prices of the pipe Bid Items. Costs for the work required in proof testing the pipe shall be considered included in the unit Contract prices for the appropriate pipe Bid Items.

Any damage resulting from testing of the Sewers and appurtenances specified in Section 7-17.3(4)A shall be made good by the Contractor at the Contractor's sole expense.

All costs of determining the source or sources of leakage and the cost to repair or replace the Sewer found defective as specified in COS Section 7-17.3(4), shall be borne by the Contractor in accordance with Section 1-05.7.

If the pipe fails the deflection test as specified in COS Section 7-17.3(4)H, all costs to locate and repair the failed sections and retest the pipe shall be borne by the Contractor in accordance with Section 1-05.7.

All costs for the Work required to furnish and install joint coupling devices as specified in COS Section 7-17.3(2)F shall be considered as included in the Bid item prices for the pipe Bid items.

"Television Inspection", per linear foot.

The cost for the Owner's labor and equipment for the videotaping during the final acceptance process and the videotaping 6 to 11 months later to recheck the pipe condition will be borne by the Owner unless additional videotape inspection is necessary to verify corrections or replacement of deficient pipe. The cost of additional television inspection, and cleaning in preparation for television inspection, to verify repairs or replaced pipe shall be borne by the Contractor. The Contractor shall also be responsible for all costs incurred in any television inspection performed solely for the benefit of the Contractor.

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If the Contractor calls for an initial Television inspection, and the pipe is not clean or has so many deficiencies that the line cannot be fully inspected, the reinspection will be charged to the Contractor, and the cost withheld from money due to the Contractor.

The Contractor shall provide all necessary water for construction and testing purposes (see Section 2-07.

Costs for the Work required to excavate, haul, import, place, backfill, and remove and re-backfill for final condition shall be included in the Bid item unit price for Temporary Schedule A (SIZE) In. Diam. Storm Sewer Pipe per linear foot.

Compensation for the cost necessary to complete the Work described in Section 7-17 will be made at the Bid item prices Bid only for the Bid items listed or referenced as follows:

"Bedding Class Special", per linear foot.

"Bedding, (Class), (Size) Pipe" and "Bedding, CDF, (Size) Pipe", per linear foot.

The unit Contract price for "Bedding, (Class), (Size) Pipe" and for "Bedding, CDF, (Size) Pipe" shall include all costs for the Work required to furnish and install bedding. Cost of Class D bedding shall be included in the Bid item for the pipe Bid item and therefore no separate or additional payment will be made for Class D bedding.

"Coated Steel Casing (Size) In. Diam. and (Size) In. Thick" per linear foot.

The unit Contract price for "Coated Steel Casing (Size) In. Diam. and (Size) In. Thick" per linear foot for other than directional drilling shall include all costs for the Work required to furnish and install casing pipe as specified in COS Section 7-17.3(2)J, including installation and removal of shoring of the jacking pit. All cost for filling the annular space when required in the Contract shall be included in this Bid item and no separate or additional payment will be made therefore.

Gravel backfill for foundation Class B required for drainage related catch basins, manholes, and vaults shall be considered included in the unit bid price for the structures per each.

"Temporary Sewer Bypass", per lump sum.

The unit Contract price for "Temporary Sewer Bypass" shall include all the Work required to bypass Sewer flow around the immediate construction work area.

"Backfill, CDF, (Size) Pipe", per cubic yard.

The unit Contract price for "Backfill, CDF, (Size) Pipe" shall include all costs for the Work necessary to furnish and place the specified backfill.

"Controlled Density Fill", per cubic yard.

The unit Contract price for "Controlled Density Fill" shall include all costs for the Work required to furnish and place the CDF as specified.

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Payment for imported material when ordered in lieu of native backfill material by the Project Engineer will be paid as "Mineral Aggregate, (Type)", or other imported material acceptable to the Project Engineer.

Foundation material when required will be paid as “Mineral Aggregate, (Type)” per cubic yard, per COS Section 4-01.5.

Where the Project Engineer determines that the existing foundation is unsuitable, and foundation material specified by the Project Engineer is not in the Contract and no Bid item for “Mineral Aggregate, (Type)” is included in the Bid Form, payment will be made in accordance with Section 1-04.1(2).

The cost for the Owner’s labor and equipment for the videotaping during the final acceptance process and the videotaping 6 to 11 months later to recheck the pipe condition will be borne by the Owner unless additional videotape inspection is necessary to verify corrections or replacement of deficient pipe. The cost of additional television inspection, and cleaning in preparation for television inspection, to verify repairs or replaced pipe shall be borne by the Contractor. The Contractor shall also be responsible for all costs incurred in any television inspection performed solely for the benefit of the Contractor. If the Contractor calls for an initial TV inspection, and the pipe is not clean or has so many deficiencies that the line cannot be fully inspected, the reinspection will be charged to the Contractor, and the cost withheld from money due to the Contractor.

The Contractor shall provide all necessary water for construction and testing purposes (see COS Section 2-07). No separate or additional compensation will be made for submittals, or for material used in the jacking operations or for the cost of the backfilling operations, including compaction.

The Contractor shall, at the Contractor's sole expense, provide pipe of increased strength classification or place a class of bedding of higher load bearing capacity, as required by the Project Engineer, when the maximum trench width specified in COS Section 7-17.3(1)A1 is exceeded by the Contractor without prior written approval of the Project Engineer. The Contractor shall furnish and install any approved imported backfill material required outside the trench neat line limits.

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7-19 SEWER CLEANOUT

This section is deleted in its entirety and replaced with the following:

7-19.1 DESCRIPTION

This Work consists of the construction of sanitary Sewer cleanouts in accordance with COSP no. 280 and as indicated in the Contract.

7-19.2 MATERIALS

All materials incorporated into the total cleanout structure shall meet the requirements of the various applicable Sections of these Specifications.

7-19.3 CONSTRUCTION REQUIREMENTS

A cleanout shall be provided for each total change of 90 degrees in grade or alignment. In no case shall the spacing of cleanouts exceed 100 feet. No cleanout will be required at the connection of the side Sewer to a riser on the public Sewer.

A suitably located cleanout in the house piping or plumbing may be considered as a cleanout for the side Sewer. Cleanouts shall consist of a wye branch in the side Sewer. All cleanouts located in the Right Of Way shall be extended to finish grade.

The extension of cleanouts to finish grade on private property is optional with the property owner. When extended to finish grade, cleanouts shall be full side Sewer diameter and shall be extended to a point not less than 6 inches nor more than 12 inches below the finished ground surface with a removable stopper which prevents passage of dirt or water. When specified in the Contract, the Contractor shall install an approved casting to provide ready access to the cleanout stopper. An 1/8-bend shall be used to deflect the side Sewer upward as a cleanout where the terminal end of the side Sewer lies upstream from the last point of connection.

Pipe joints shall be the type specified in COS Section 7-17.3(2).

Trench excavation, bedding, and backfill requirements shall comply with the appropriate requirements of COS Section 7-17. The trench excavation shall be made in such a manner as to provide an undisturbed base upon which the pipe shall be placed. Bedding around the wye and under the pipe connecting to the wye shall be thoroughly compacted. Otherwise, construction shall conform to the requirements shown on COSP number 280.

7-19.4 MEASUREMENT

Measurement for “Sewer Cleanout, (Size)” will begin at the wye branch and extend through the casting as shown on COSP number 280 and will be per each.

7-19.5 PAYMENT

“Sewer Cleanout, (Size)”, per each.

The unit Contract price per each for “Sewer Cleanout, (Size)” shall include all costs for the Work required for furnishing and installing the wye, Sewer pipe, pipe bands, pipe plug, casting, and concrete collar.

7-21 CONTROL HOUSE AND BASCULE PIER PLUMBING (NEW SECTION)

7-21.1 DESCRIPTION

This Work consists of furnishing all labor, equipment and materials and performing all work necessary to install, test and place in correct, satisfactory operating condition a new water supply

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and sewage systems, including plumbing for the operator house and sump pump systems for both the North and South Piers.

The Contractor's attention is direct to Section 8-26 for information related to bascule pier / control tower features.

7-21.1(1) CODE

The installation and construction of all plumbing equipment shall conform to the requirements of the 2006 Uniform Plumbing Code

7-21.1(2) SUBMITTALS

The Contractor shall prepare and submit for review working drawings and catalogs for the new piping and miscellaneous components.

Piping configuration and valve locations (including sillcocks and expansion compensators) showing its relation to the structure, control house and other work including structural, electrical, architectural, and other mechanical.

Details showing all steel support for piping and the steel connection to existing structure members.

Manufacturers catalog information and data for piping, fittings, expansion joints, insulation and covers, heat trace, piping supports including installation and maintenance instructions.

Operating and Maintenance Manual - Provide an operating and maintenance manual with the following information.

1. Product data including electrical requirements and catalog cuts of all equipment specified herein and as shown on the Plans.
2. Product data for each specialty and/or special duty equipment. Include rated capacities of selected models, furnished specialties and accessories, and installation instructions.
3. Shop drawings detailing dimensions, required clearances, for installation.
4. Maintenance data for water heaters, sump pump, grinder pump, and any other specialties for inclusion in operating and maintenance manual.

7-21.2 MATERIALS

All equipment and materials furnished under the items specified herein shall be brand-new. All new equipment, materials and workmanship shall be first class in every particular, and shall be manufactured and installed to the satisfaction of the Project Engineer.

7-21.2(1) PIPING AND FITTINGS

DWV Piping - Drain, waste and vent piping in the pier and inside the operator's house shall be service weight centrifugal casted cast iron pipe conforming to ASTM designation A 74, bell and spigot with neoprene gaskets. Vent piping shall have no-hub joints. Provide cleanouts where

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shown on the Plans. DWV pipe concealed inside walls may be polyvinyl chloride (PVC) Schedule 40 plastic pipe conforming to ASTM D-2665. Fittings for PVC pipe shall be polyvinyl chloride (PVC) conforming to ASTM D-3034.

Potable Water Supply Piping - All water pipe and fittings shall be NSF approved for potable water service. Water piping in the building and not exposed shall be copper water tube conforming to ASTM designation B 88 type L soft drawn. Connections shall be wrought copper and copper alloy solder joint pressure fittings in accordance with ASME/ANSI B 16.22. Solder shall be alloy grade SN 95 (95/5). Shock absorbing devices shall be installed at each individual fixture. Shock absorbers shall be copper tube, 18" high. Potable water piping in the pier and exposed inside the building shall be black steel galvanized pipe conforming to ASTM A53.

7-21.2(2) WATER VALVES

Ball Valves for copper piping shall be two-piece construction with bronze body conforming to ASTM B-62, having standard porting and solder ends. Valve shall include chrome-plated ball, replaceable Teflon seats and seals, blow proof stem and vinyl covered handle. Valves shall be rated for 600 psi working pressure. Size shall be equal to the size of the pipe on which it is installed.

All sillcocks shall be frost-proof type with vacuum breaker for antisiphon backflow prevention. These sillcocks shall drain when closed to prevent freezing. Outlet connection shall meet ANSI B1.20.7.

Through-Wall Style – body shall be brass with copper pipe and removable thermoplastic handle. Sillcocks shall have a minimum pressure rating of 125 psi and temperature range from 0° to 130°F.

7-21.2(3) UNIONS

Unions shall be two-piece construction with bronze body conforming to ASTM B-62, having standard porting and solder ends. Union shall be rated for 600 psi working pressure. Size shall be equal to the size of the pipe on which it is installed.

7-21.2(4) EXPANSION COMPENSATOR

Supply water line expansion compensators Metraflex model HPFF or as manufactured by Flexonics, Unaflex or equivalent. Furnish expansion compensator with same diameter as water line and solder joint ends.

7-21.2(5) BACKFLOW PREVENTION DEVICE

A backflow preventer assembly shall be provided and installed on the water supply as shown on the Plans. The backflow preventer assembly shall consist of 2 bronze-bodied gate valves and 2 bronze-bodied spring loaded check valves in series. The assembly shall come complete with test cocks. All internal parts of the check valves shall be accessible from the top without removing the check valve body from the line. All valves within the assembly shall be the same size as the line on which they are installed and shall be rated at 150 psi. The backflow preventer assembly

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shall be approved by the local governing authority and the AWWA for protection of potable water supplies of the type required for this project.

7-21.2(6) INSULATION AND HEAT TRACING

Pipe and fitting insulation shall be jacketed fiberglass pipe insulation. Thickness is as shown on the Plans. Insulation at pipe supports shall be Calcium Silicate.

Insulation shall be covered over pipe and fittings with PVC covers, 20 mils thick. PVC covers shall be secured using stainless steel clamps. A wear shield, galvanized 1/16-in thick and 12" long, shall be placed between each support and the PVC insulation jacket. The wear shield shall be secured to the PVC jacket.

Insulation for expansion compensators shall be removable weatherproof flexible insulation blankets designed to be retrofitted and fasten for easy installation and removal. Fastenings shall include lacing or buckle fastening. Insulation R-value shall not be less than the jacketed fiberglass pipe insulation.

Heat trace cable shall be constructed of 16AWG stranded copper bus wire embedded in parallel self-regulating polymer core that varies its power output to respond to temperature along its length. The heat cable shall be covered by a radiation cross-linked modified polyolefin dielectric jacket. Output shall be 5 watts per foot. The heat trace cable shall be capable of maintaining 40 degree F pipe surface temperature with an outside ambient temperature of 0 degree F. Provide thermostatic control for heat trace to maintain temperature.

7-21.2(7) HOTWATER HEATER

Water Heater – One electric tankless water heater shall be furnished in each control house and shall be Stiebel Eltron Model DHC 6-2 or equivalent that meets the requirements of Contract Documents including the following unless noted otherwise:

1. Tankless Water Heater is designed for installation at the point of use.
2. Electrical input of 6000 watts maximum, 480 VAC.
3. Unit shall provide 41 degree F temperature rise at 1 GPM.
4. The heating elements shall be controlled by a flow switch and by a scald-guard thermostat, which keeps the water temperature within safe limits at all times.
5. Water heaters shall be equipped with a safety high-limit with manual reset of copper design.
6. Minimum water flow to activate unit 0.47 GPM/1.8 l/min.
7. Pressure loss in unit 2.88 PSI/0.23 bar
8. Maximum working pressure 125 PSI/10 bar
9. Tested to pressure 250 PSI/20 bar

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10. Water connections 1/2" NPT

11. Dimensions: H 14-3/16" x W 7-7/8" x D 4-1/8"

7-21.2(8) SUMP PUMP

The Contractor shall furnish and install four sump pumps (two at each pier) and corresponding discharge piping with all accessories. These shall be located and installed as shown on the Plans.

Each sump pump assembly shall have the following characteristics:

1. Weil 2558 2 inch Heavy duty submersible wastewater pump or equivalent
2. Bronze impeller, type 300 stainless steel shaft.
3. Capacity: 50 gpm at 60 ft. head (minimum).
4. Air Filled Hermetically Sealed Motor: 5 horsepower, 480 V, 3 phase.3450 RPM
5. Double mechanical seals.
6. Double sealed grease lubricated ball bearings.
7. Cast iron construction.
8. Max sphere 2 inch.
9. Floor-mount.
10. Pump shall be rated at 120 degrees F. continuous, 150 degrees F. intermittent.
11. Three mercury float switches for pump “on”, pump “off” and high water alarm. (Provisions shall be made for “high water remote alarm indication at the enunciator panel in the control house)
12. Float control assembly shall include support pole, clamps and (floor or wall) mounting brackets. All of stainless steel construction.

Pump control Panel shall be located as designated in the Plans and shall have the following characteristics:

1. Control Panel in NEMA 4X Wall mount Enclosure
2. Overload Protection
3. Motor Contactor
4. 480/120V control transformer
5. High water horn and light with silencing switch and reset
6. Dry contact for remote high water alarm

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7. Padlocking hasp

8. Hour meter

9. UL listed

All equipment shall be furnished and installed to suit the pump and the electrical system. This shall include all support brackets, piping, check valve, gate valve, float switches, sleeves, anchors, hangers, etc. for a complete and ready to operate installation. All conduits, electrical starters, controls, boxes, wiring, cables and other equipment required to extend the necessary circuits from the control house to the respective components shall be furnished and installed as specified elsewhere in these Special Provisions. The Contractor shall coordinate all requirements for operation under all ambient conditions and for accessing the equipment.

All apparatus for controlling the operation of the sump pump system and specified elsewhere in these Special Provisions

7-21.2(9) PIPE SUPPORTS

Piping Supports - Construct piping supports of ASTM A709 Grade 36 material and hot dip galvanize per ASTM A153.

7-21.2(10) MISCELLANEOUS

Contractor shall provide all required couplings necessary to transition from different type of piping material in sewer system. Couplings shall be sized as required.

7-21.3 CONSTRUCTION REQUIREMENTS

7-21.3(1) WARRANTY AND QUALITY CONTROL

All manufacturers shall warrant all products and associated hardware to be free of defects in material and workmanship for a period of five (5) years from the date of final acceptance. Final Acceptance shall be in accord with the Standard Specifications. Any defect within this period shall be repaired or replaced by the Manufacturer, at total cost to the Manufacturer, including labor, parts, and transportation. The Contractor shall provide letters to the suppliers with copies to the Project Engineer, identifying the scheduled date of final acceptance of the bridge and therefore the date the warranty shall begin. If the date of final acceptance is extended, it shall be the Contractor's responsibility to extend the commencement of the warranties from the suppliers at no cost to the Department.

7-21.3(2) INSTALLATION

Contractor shall field verify all locations where the water, sewer, and sump pump piping are to be installed to ensure piping will maintain as straight a line as possible.

Contractor shall install water line expansion compensators and supports as required to accommodate the expansion and contraction of the copper water line for a minimum temperature change (rise/drop) of 60 degree F at ambient temperature of 60 degree F during installation.

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Piping at the compensators must be properly guided and anchored per the recommendations of the Expansion Joint Manufacturers Association.

PVC piping shall be stored prior to installation on racks to provide continuous support to prevent sagging. No sharp edges or heavy objects shall come into contact with the piping or fittings. Piping shall not be subjected to excessive heat prior to or during installation.

PVC piping shall be installed and joined as per the pipe manufacturer's specifications and as specified herein for PVC joints using solvent cement.

Where flanges on PVC pipe are required, the Contractor shall install flanges using solvent cement and shall use full-face flat-type gaskets between flanges.

Cutting of PVC pipe shall be square cuts at pipe ends, the inside diameter shall be deburred and the outside diameter for the PVC pipe shall be beveled to the manufacturer's requirements.

All horizontal portions of above ground piping shall be supported using reinforced insulation as previously specified so that the weight of the pipe will not crush the insulation at the supports. A wear shield shall be placed between each horizontal support and the PVC insulation jacket. The wear shield shall be secured to the jacket utilizing stainless steel clamps.

All supports for vertical portions of piping shall be directly fastened to the piping prior to the installation of the insulation. The Contractor shall include additional supports as required to accommodate thrust loads at all elbows and turns. Additional extraneous loads on the piping such as cleanouts and valves shall be properly supported.

Prior to the installation of the insulation, the Contractor shall install and secure the two heat trace lines including accessories, as provided elsewhere in these Special Provisions, to the water and sump pump piping. The heat trace shall be loosely wrapped around the pipe expansion joints to ensure free movement of the joints.

The Contractor shall install insulation on all portions of the water and sewer piping except for the vent piping and cleanout extensions that may remain exposed. Insulation shall not be installed over any fittings or joints until that section of piping has been tested and accepted.

7-21.3(3) TESTS AND DISINFECTION

A calibration test shall be performed on the sump pump to determine the flow rate in GPM. After installation a known quantity of water shall be pumped into the sewer line. The minimum quantity of water shall be 500 gallons. The test shall be repeated three times and the result averaged.

The Contractor shall not enclose, cover or put into operation the water or sewer piping systems until they have been inspected, disinfected (water only), and approved by the Project Engineer or other duly authorized representative. The Contractor shall give two (2) weeks notice to the Project Engineer prior to performing any tests.

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Testing of the water, waste and vent line shall be in accordance with the procedures of the authority having jurisdiction or, in the absence of a published procedure in accordance to the Plumbing Code.

Disinfection of the water lines shall be in accordance with the Plumbing Code or the Authority having jurisdiction.

The Contractor shall furnish all labor, materials and equipment necessary to perform the above pressure testing and disinfection.

7-21.4 MEASUREMENT

Control house and bascule pier plumbing will not be measured but will be paid for on a lump sum basis in accordance with Section 1-04.1.

7-21.5 PAYMENT

Payment will be made in accordance with Section 1-04.1, for the following Bid item:

"Control House and Bascule Pier Plumbing", lump sum.

The lump sum Contract price for "Control House and Bascule Pier Plumbing" shall be full pay for all costs in connection with furnishing all materials, labor, tools, and equipment necessary for the manufacture, fabrication, transportation, erection, testing, and sanitizing all aspects of the Plumbing system.

7-22 SPECIAL SOIL MIX (LANDSCAPE BIORETENTION SOIL) (NEW SECTION)

7-22.1 DESCRIPTION

This Work consists of the installation of Bioretention Soil in rain gardens intended to receive surface runoff for infiltration.

7-22.2 MATERIALS

Materials for bioretention soil will be specified in the Contract and consist of one or more of the following:

Special Soil Mix (Landscape Bioretention Soil)	9-14.1(3)B

7-22.3 CONSTRUCTION REQUIREMENTS

7-22.3(1) GENERAL

Bioretention soil shall be protected from all sources of additional moisture at the Supplier's site, in covered conveyance, and at the Project Site until incorporated into the Work. Soil placement and compaction shall not occur when the ground is frozen or excessively wet (3% above optimum moisture content), or when the weather is too wet as determined by the Project Engineer.

When the Contract specifies testing by a Contractor provided testing laboratory, the laboratory must be an STA, AASHTO or ASTM or other designated recognized standards organization

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accredited laboratory with current and maintained certification. The testing laboratory shall be capable of performing all tests to the standards specified, and shall provide test results with an accompanying Manufacturer's Certificate of Compliance.

7-22.3(2) SUBMITTALS

At least 15 working days prior to placement of Bioretention Soil, the Contractor shall submit to the Project Engineer for approval:

1. Grain size analysis results of Mineral Aggregate performed in accordance with ASTM D 422, Standard Test Method for Particle Size Analysis of Soils;
2. Quality analysis results for compost performed in accordance with Seal of Testing Assurance (STA) standards, as specified in Section 9-14.4(9);
3. Organic content test results of mixed bioretention soil. Organic content test shall be performed in accordance with Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, “Loss-On-Ignition Organic Matter Method”;
4. Modified Proctor compaction testing of mixed bioretention soil, performed in accordance with ASTM D 1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort;
5. A description of the equipment and methods to mix the Mineral Aggregate and compost to produce bioretention soil;
6. Permeability or hydraulic conductivity testing of the bioretention soil, performed in accordance with ASTM D 2434, Standard Test Method for Permeability of Granular Soils. For the landscape bioretention soil assume a relative compaction of 85 percent of modified maximum dry density (ASTM D 1557); and
7. Provide the following information about the testing laboratory(ies):
    a. name of laboratory(ies) including contact person(s),
    b. address(es),
    c. phone contact(s),
    d. e-mail address(es);
    e. qualifications of laboratory and personnel including date of current certification by STA, ASTM, AASHTO, or approved equal.

7-22.3(3) BIORETENTION SOIL CONSTRUCTION

The Contractor shall not start bioretention construction until the Project Site draining to the bioretention area has been stabilized and authorization is given by Project Engineer.

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At the locations shown on the Plans, excavate, grade, and shape to the contours indicated to accommodate placing of bioretention soil to the thicknesses required. Dispose of excavated soil or reuse elsewhere as the Contract or Project Engineer will allow. Scarify the subgrade soil a minimum of 2 inches deep where slopes allow, as determined by the Project Engineer prior to placing bioretention soil.

Mixing or placing bioretention soil shall not be allowed if the area receiving bioretention soil is wet or saturated or has been subjected to more than ½-inch of precipitation within 48-hours prior to mixing or placement. The Project Engineer will have final authority to determine if wet or saturated conditions exist.

Place landscape bioretention soil loosely. Final grade shall be measured only after the soil has been water compacted, which requires filling the cell with water, without creating any scour or erosion, to at least 1 inches of ponding. If water compaction is not an option, final grade shall be measured at X inches above the grade specified on the Plans to allow for settling after the first storm. Special Soil Mix shall be calculated by depth of soil x 0.15 and rounded up to the nearest whole number.

7-22.4 MEASUREMENT

Measurement for Special Soil Mix (landscape bioretention soil) will be per cubic yard.

7-22.5 PAYMENT

Payment will be made in accordance with Section 1-04.1 for the following Bid item:

"Special Soil Mix (Landscape Bioretention Soil)" per cubic yard.

The unit Contract price for "Special Soil Mix (Landscape Bioretention Soil)" shall include all costs for the Work necessary to furnish, place, compact, excavate, grade, shape, mix, and dispose of bioretention soil.

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