

1. Submit to Ecology's Representative for review for the purpose of checking for general conformance with the contract documents.
  2. Submit to Ecology's Representative to allow Quality Assurance testing by Ecology. Ecology may or may not perform testing at their discretion. Provide samples as described in Section 01400 - Construction Quality Control/Quality Assurance.
  3. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article above and for record documents purposes described in Section 01700 - Contract Closeout.
- B. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- C. Include identification on each sample, with full Project information.
- D. Submit the number of samples specified in individual specification sections; one of which will be retained by Ecology's Representative.
- E. Review samples that may be used in the Work are indicated in individual specification sections.

#### 1.10 DESIGN DATA

- A. Submit for Ecology's Representative records.
- B. Submit information for the purpose of verifying general conformance with the design concept expressed in the Contract Documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by Ecology's Representative.

#### 1.11 TEST REPORTS

- A. Submit test reports from Construction Quality Control activities as outlined in Section 01400 for Ecology's Representative records.
- B. Submit test reports for information for the purpose of verifying general conformance with the design concept expressed in the Contract Documents.

#### 1.12 CERTIFICATES

- A. When specified in individual specification sections, submit certifications by the manufacturer, installation/ application subcontractor or Contractor to Ecology's Representative in quantities specified for Product Data.

- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Ecology's Representative.

1.13 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for Ecology's Representative records.
- B. Submit report in duplicate within 30 calendar days of observation to Ecology's Representative for information.
- C. Submit for information for the purpose of assessing conformance with information given and the design concept expressed in the contract documents.

1.14 SAMPLES OF MANUFACTURED MATERIALS

- A. Provide Ecology's Representative with samples of manufactured materials to allow quality assurance testing in accordance with Specification Section 01400 - Construction Quality Control/Quality Assurance.

1.15 MEASUREMENT AND PAYMENT

- A. Measurement refers to acceptable versions of each submittal. Payment is a [lump sum or unit cost] based on receipt by Ecology of acceptable submittals, including monthly Application for Payment.

2 PART 2 PRODUCTS

Not Used.

3 PART 3 EXECUTION

Not Used.

END OF SECTION

**SCHEDULE A**  
**SUBMITTAL LIST**

The submittal list is a tabulation of requirements identified in other specification sections:

| <b>SUBMITTAL NO.</b> | <b>DESCRIPTION</b>                                  | <b>SPECIFICATION SECTION</b> |
|----------------------|---|------------------------------|
| 1                    | Construction Quality Control/Quality Assurance Plan | 01400                        |
| 2                    | Health and Safety Plan                              | 01500                        |
| 3                    | Construction Survey                                 | 01450                        |
| 4                    | Contract Closeout                                   | 01700                        |
| 5                    | Earthwork   | 02200                        |
| 6                    | Irrigation System Design and Specification          | 02900                        |

**SECTION 01400: CONSTRUCTION QUALITY CONTROL / QUALITY ASSURANCE**

## 1 PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Construction quality control - control of installation.
- B. Tolerances.
- C. Construction quality control testing services by contractor.
- D. Construction quality assurance - testing services by Ecology.
- E. Manufacturers' field services.

## 1.2 RELATED SECTIONS

- A. Section 01300 - Submittals.
- B. Section 01700 - Project Closeout: Certifications and Project Records.

## 1.3 REFERENCES AND STANDARDS

- A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Contract Documents, except where a specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.

## 1.4 SUBMITTALS

- A. Mark all submittals in accordance with provisions of Section 01300.
- B. Provide Ecology's Representative with test results and certifications from Manufacturer's Quality Control Plan a minimum of ten calendar days prior to installation of materials on site.
- C. Duplicate Samples: Provide Ecology's Representative with duplicates for all samples as specified within the appropriate technical specifications.



- D. Construction Quality Control Plan: Submit the following in writing:
  - 1. Authorities and responsibilities of inspection and testing personnel.
  - 2. Experience and qualifications of inspection and testing personnel to be assigned and name and location of the testing facility to be used.
  - 3. Description of the testing facilities and information on when and where each of the required materials tests will be performed.
- E. Chain-of-Custody Forms: Provide Ecology's Representative with copies of chain-of-custody forms along with test results and laboratory quality assurance documentation.
- F. Equipment Calibration Certification: Within ten (10) calendar days prior to commencing with work requiring testing, provide Ecology's Representative with certification of laboratory equipment calibration to meet appropriate ASTM standards.

#### 1.5 CONSTRUCTION QUALITY CONTROL (CQC) - CONTROL OF INSTALLATION

- A. Actively monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including performance of each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Ecology's Representative before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure Products in place with positive anchorage designed and sized to withstand stresses, vibration, physical distortion, or disfigurement from river flow, exposure to sun, or other natural forces.

#### 1.6 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Ecology's Representative before proceeding.
- C. Adjust products to appropriate dimensions; position before securing Products in place.

#### 1.7 CONSTRUCTION QUALITY CONTROL TESTING SERVICES BY CONTRACTOR

- A. Contractor will appoint, employ, and pay for specified services of an independent firm qualified to perform Construction Quality Control (CQC) testing in accordance with the testing guidelines of Project Specifications.
- B. The Contractor's CQC testing firm will perform tests and other services specified in individual specification sections.
- C. All samples will be obtained in duplicate. One set of samples will be provided to Ecology's Representative within 24 hours of collection to allow for Quality Assurance verification testing by Ecology's Representative.
- D. Testing and source quality control may occur on or off the project site. Ecology's Representative is to be notified of all in-situ sampling or other tests at least 24 hours prior to testing activities.
- E. Reports will be submitted by the CQC testing firm to Ecology's Representative, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- F. Coordinate Work with Contractor's CQC testing firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested:
  - 1. Notify Ecology's Representative and independent CQA testing firm 24 hours prior to expected time for operations requiring services.
  - 2. Any tests, or other services provided by the Contractors CQC testing firm, performed without prior knowledge of Ecology's Representative will be automatically rejected and materials tested may be subject to rejection and removal. Re-testing on these materials will be performed at no cost to Ecology, and with Ecology's Representative present.
- G. Construction Quality Control testing does not relieve Contractor from performing Work to Contract requirements.



- H. Maintain a log of all test and samples conducted: Indicated date, time, location (on-site tests), reference specification method and personnel present at time of sampling/testing.
- I. Maintain accurate, thorough file of sample chain-of-custody forms.

## 1.8 CONSTRUCTION QUALITY ASSURANCE TESTING SERVICES BY ECOLOGY

- A. Ecology will appoint, employ, and pay for specified services of an independent firm qualified to perform construction quality assurance (CQA) testing.
- B. Cooperate with the Ecology's CQA testing firm; furnish duplicate samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested:
  - 1. Notify Ecology's Representative 24 hours prior to expected time for operations requiring testing services.
- C. Testing by Ecology does not in any way relieve Contractor to perform Work to Contract requirements including, but not limited to, CQC tests and documentation.
- D. Test results by Ecology's CQA testing firm will be compared with those prepared by the Contractor's CQC test firm. Test results that indicate variance of more than 10 per cent, or non-conformance with the specified requirements will require retesting. Costs for Contractor retesting will be the responsibility of the Contractor.

## 1.9 MEASUREMENT AND PAYMENT

- A. Work under Section 01400 - Construction Quality Control / Quality Assurance is considered incidental and included in other work; no separate payment will be made. Includes provision of independent testing laboratory services, field and laboratory testing and analyses, suitable equipment, materials and personnel to provide the quantity and types of test required in the Technical Specifications.

## 2 PART 2 PRODUCTS

Not Used.

### 3 PART 3 EXECUTION

#### 3.1 EQUIPMENT CALIBRATION

- A. All equipment utilized for CQC/QA field testing, QC testing, and laboratory tests are to be calibrated according to the applicable and appropriate American Society for Testing of Materials (ASTM) standards within the immediate 12 months prior to use for this project. If applicable and appropriate ASTM standards are not available, use of the equipment manufacturer's recommended methods is acceptable.
- B. Certification of equipment calibration by the CQC testing personnel is to be submitted to Ecology's Representative a minimum of ten (10) calendar days prior to use for this project.
- C. Should significant variance in test data or measurements occur, and there is reason to believe that it may be attributed to the equipment rather than to the material or test procedures, re-calibration will be required, and subsequent documentation of satisfactory calibration activities will be submitted.
- D. Documentation is required for all re-calibration efforts performed on equipment used for this project.
- E. Ecology's Representative may inspect both the sampling and testing procedures prior to implementation for this work. The testing laboratory (including and equipment and personnel) should be fully operational and available for inspection at least 48 hours (two working days) prior to utilization for on-site quality control testing support.

#### 3.2 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Immediately notify Ecology's Representative of discrepancies or unacceptable site conditions prior to commencing with new Work.

3.3 PREPARATION

- A. Prepare substrate surfaces prior to applying next material or substance.
- B. Apply manufacturer required or recommended materials prior to applying any new material or substance in contact or bond.

3.4 PROTECTION

- A. Protect completed work elements from damage during ongoing construction operations.
- B. Protect completed work from sediment, debris, or other materials found on-site.
- C. Store and handle products in accordance with the manufacturer’s instructions.

3.5 INSPECTIONS

- A. Provide inspections of Work as specified in the Technical Specifications.

3.6 TESTING

- A. Provide testing of Work as specified.
- B. A Summary of tests and responsibilities follows in Table A.

**Table A. Summary of conformance sample and test requirements.**

| Work Element                         | Spec. Sect. | Key Property                                     | Sample/ Test | Sampling Plan/ Frequency | Standard Test Method                       |
|--------------------------------------|-------------|--|--------------|--------------------------|--|
| <b>Site Earthwork</b>                |             |  |              |                          |  |
| Topsoil                              | 02200       | Gradation  | CT/COR       | 1/source                 | ASTM D422                                  |
|                                      |             | Organics, nitrogen screen, micro-macro nutrients | CT/PE/COR    | 1/source                 | Western States<br>ASTM D5268<br>ASTM D4972 |
|                                      |             |  | CT/PE/COR    | 1/source                 |  |
|                                      |             |  | CT/PE/COR    | 1/source                 |  |
| pH                                   | CT/PE/COR   | 1/source   | ASTM D1557   |                          |  |
| Geotextile Fabric and Coir Materials | 02200       | Grab tensile strength                            | CT/MFR       | 1/source                 | ASTM D4632                                 |
| Trail and Chevron Cap Materials      | 02200       | Gradation  | CT/COR       | 1/source                 | ASTM D422                                  |

\* Responsibility for sampling/testing:

- CT - Contractors personnel (CQC activity)
- PE - Sampling and testing under direction & certification of Registered Professional Engineer (CQC activity)
- COR - Sampling, testing, measuring and/or data performed by Ecology’s Representative (QA activity)
- MFR - Manufacturer

END OF SECTION



**SECTION 01450: CONSTRUCTION SURVEY**

## 1 PART 1 GENERAL

## 1.1 SECTION INCLUDES

- A. Control points.
- B. Construction staking.
- C. As-built survey.

## 1.2 REFERENCE STANDARDS

- A. Revised Code of Washington Chapter 58.09 RCW: Survey Recording Act [1973 c50 §1].
- B. Revised Code of Washington Chapter 58.20.120 RCW: Washington Coordinate System [1989 c54 §9].
- C. Datum: State Plane coordinates based on Washington State Department of Transportation Highway Monuments GP32090-52 and GP32090-53 NAD 1983/91 Washington North Zone. Vertical NAVD 88 Orthometric Heights based on WSDOT Highway Monuments GP32090-49 and GP32090-53 and GP32090-52 longitude and latitude NAD 83/91.
- D. Coordinates: Horizontal and vertical coordinates shall be in feet.

## 1.3 RELATED SECTIONS

- A. Section 01300 - Submittals.
- B. Section 02200 - Earthwork.

## 1.4 QUALIFICATIONS

- A. All surveys must be performed by or under the direct supervision of a Professional Land Surveyor, currently registered by Washington State Department of Licensing, Board of Registration for Professional Engineers and Land Surveyors.
- B. All surveys must be performed within the National Map Accuracy Standards of accuracy when related to the control survey data upon which it is based.

## 1.5 MEASUREMENT AND PAYMENT

- A. Construction Survey: Section 01450 - Construction Survey is considered incidental and included in other work; no separate payment will be made. Work includes all survey activities for the Island Complex site, including but not limited to: provision of suitable equipment, materials and personnel to provide establishment of permanent horizontal and vertical control for the site from established benchmarks, cross section staking, and layout of primary project elements.

## 1.6 SUBMITTALS

- A. Construction Staking: Provide one reproducible copy of construction staking locations bearing seal of the Professional Land Surveyor in responsible charge.
- B. As-built Survey: Provide one reproducible copy of topographic survey of the project area after construction has been completed bearing seal of the Professional Land Surveyor in responsible charge.

## 2 PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Use materials and equipment suitable for satisfactory completion of the Work.

## 3 PART 3 EXECUTION

### 3.1 CONTROL POINTS

- A. Control Points: Locate survey control points as indicated on the site topographic survey available at [www.ridolfi.com/spokaneriver](http://www.ridolfi.com/spokaneriver).
- B. Notify Ecology's Representative if the control points indicated in plans are not found in the field.

### 3.2 CONSTRUCTION STAKING

- A. From established survey controls as shown on the survey, provide construction staking of corners, centerlines, limits of capping, edge of trails to be capped, limits and other critical points as necessary to commence with Work within this Contract. Incidental location adjustments, as directed by Washington Department of Ecology's Representative, may be required based on site-specific conditions.
- B. Contractor is responsible for maintaining construction staking throughout project duration. Re-establishment of disturbed stakes, or re-survey of site control due to disturbed site survey stakes, are both incidental to construction staking.

### 3.3 AS-BUILT SURVEY

- A. From established survey control as shown on the drawings, conduct a topographic survey of the project area after construction is complete. Survey shall include locations of capped areas, trails, irrigation system and other physical features installed during the construction effort.
- B. Collect sufficient survey data to accurately represent the project area.
- C. Generate one-foot contours throughout the site and show breaks in slope and other notable features.

### 3.4 FORMAT FOR DELIVERABLES

- A. Digital Survey data for the as-built survey should include:
  - 1. Copy of field notes and sketches of the survey.
  - 2. Hard copy description of layers.
  - 3. Signed and sealed hard copy base map and contour plot.
  - 4. Provide digital information on compact disk with hardcopy printout; information should be provided in .DWG format (AutoCAD 2005 or earlier). Data should be provided in 3D format (northing, easting, elevation, or Y,X,Z).
  - 5. Drawing scale: Minimum one (1) inch = fifty (50) feet.
  - 6. Preferred layering:
    - a. Repetitive symbols made into blocks, and defined on layer 0.
    - b. All entities shall be drawn “by layer” as opposed to individual properties.
    - c. Use one line type and one color per layer as opposed to numerous colors/linetypes on a single layer.
    - d. Preface each layer with the initials of the Survey company (example, Survey Company: SC “layername”).
    - e. Database text annotation will be coordinated so the text will be right-reading.
    - f. Place text on separate layers.

END OF SECTION