TECHNICAL SPECIFICATIONS
FINAL CLEANUP ACTION

BSB DIVERSIFIED, INC. PROPERTY
KENT, WASHINGTON

JULY 2009
(REVISED JUNE 2011 WITH CHANGE ORDER #8)

PREPARED FOR

B.S.B. DIVERSIFIED COMPANY, INC.

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PREPARED BY

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CERTIFICATION PAGE

The engineering material and data contained in these technical specifications were prepared under the supervision and direction of the undersigned, whose seal as a registered professional engineer in the State of Washington is affixed below.

Vista Consultants, LLC

_____

Roger B. North, P.E.

SPECIFICATIONS

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DIVISION 1

GENERAL REQUIREMENTS

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. Construct Final Cleanup Action elements at the BSB Diversified Company, Inc. Property located at 8202 South 200th Street, in Kent, Washington. The work follows from activities started in 2009 and subsequently suspended by the Owner to further define existing conditions and cleanup action options. The work that began in 2009 was considered "Phase I" of the Final Cleanup Action and includes Items 1 through 14 listed below. The remainder of the Final Cleanup Action was to be completed in "Phase II" which includes Items 15 through 19 listed below. For contracting purposes, the Phase I and II designations will be maintained. The work will include the following components:

PHASE I

1. Installation of erosion control measures around construction area.
2. Preparation of construction area, including clearing of vegetation and removal of existing gravel, concrete pads, and concrete wall elements.
3. Protection of existing groundwater extraction and treatment equipment and all existing groundwater monitoring wells.
4. Earthwork, groundwater management, and other temporary works required to perform excavation to construct reinforced concrete reactor vault.
5. Excavation below reactor vault design grades to construct, using the tremie method, a mass concrete slab below the reactor vault to resist hydrostatic uplift pressures.
6. Stockpiling excavated soils in the existing on site soil stockpile, and establishing erosion and sediment control measures around the stockpile area and managing soil stockpile in accordance with erosion and sediment control requirements.
7. Constructing, by the tremie method, a mass concrete slab below the reactor vault.
8. Constructing reinforced concrete reactor vault, including mat foundation, walls, and lids.
9. Furnishing and installing piping inside the vault, and pipe penetrations between the chambers in the reactor vault, and means for installing a contingency pumping system as components of the treatment system.
10. Backfilling around reactor vault with permeable gravel, and installing HDPE collection pipes within the gravel.
11. Installing geotextile between gravel backfill and native soils.
12. Protecting all existing monitoring wells.
13. Constructing a horizontal discharge well from the reactor vault to an off-site infiltration location.
14. Cleaning up site at termination of work.

PHASE II

15. Constructing a soil-bentonite cut-off wall around the property.
16. Performing advance potholing and excavation along a portion of the soil-bentonite cut-off wall to explore for the presence of untreated industrial waste sludges.
17. Performing site grading and constructing final cover components over the northern portion of the site.
18. Protecting existing monitoring wells, decommissioning certain existing monitoring wells, extending other existing monitoring wells to match final cover grades, and installing additional monitoring wells as required by the compliance monitoring plan.
19. Cleaning up site at termination of work.

B. The CONTRACTOR will be required to complete the work as indicated on the Construction Drawings and defined in the Contract Documents within the time frame given in the Agreement.

C. The OWNER or other prime CONTRACTORS may perform other construction not covered under these Contract Documents. The CONTRACTOR must coordinate its operations with those of the OWNER and other prime CONTRACTORS. Other work will be identified during coordination meetings.

1.2 CODES AND REGULATIONS

A. Meet requirements of applicable laws, statutes, regulations, ordinances, safety regulations of federal, state, city, and county jurisdictions and as may be further referenced in the Contract Documents.

B. Comply with provisions of federal, state, and local statutes, ordinances, and regulations dealing with the prevention of environmental pollution of natural resources that affect the project.

C. If the CONTRACTOR must undertake additional work due to the enactment of new, or the amendment of existing, statutes, ordinances, and regulations dealing with the project, the OWNER will issue a change order setting forth the additional work that must be undertaken. The change order will not invalidate the Contract and there will be, in addition to a reasonable extension of contract time, if necessary, a reasonable adjustment in the contract price to compensate the CONTRACTOR for all costs and expenses incurred, including overhead, and profit, as a result of the additional work.

1.3 INSPECTION AND TESTING

A. The OWNER or its authorized representative as part of the Construction Quality Assurance (CQA) program will perform all tests identified in the technical specifications as the responsibility of the OWNER or CQA Organization or deemed necessary by the Design Engineer of Record.

B. Testing described in these specifications as construction quality control (CQC) or manufacturer's quality control (MQC) testing is the responsibility of the CONTRACTOR unless OWNER furnishes products.

1.4 SITE CONDITIONS

A. CONTRACTOR'S Staging Area: An area will be set aside on the project property for the CONTRACTOR's use as a staging area for workers, equipment, and materials. CONTRACTOR must restore the staging area to its original condition at the conclusion of work.

B. South Portion of Site: The existing asphalt surface on the south portion of the site will form the final cover component for that part of the site. CONTRACTOR shall not use that portion of the site as a staging area, and shall avoid activities within that part of the site, except as will be necessary to construct the soil-bentonite cutoff wall. CONTRACTOR shall be responsible for any damage caused to the asphalt and for any restoration required resulting from damage during activites unrelated to the soil-bentonite cutoff wall.

C. Disposal of Waste Material: Burning will not be permitted on the site. Dispose waste in accordance with all Federal, State, and local laws relating to fire prevention, air pollution control, and other restrictions. The OWNER must approve use of the on-site waste disposal units.

D. Fire Prevention and Protection: Perform all work in a fire-safe manner. Comply with applicable local and state fire prevention regulations.

1.5 CONSTRUCTION WATER

A. CONTRACTOR is responsible for securing water supply for construction water and dust control.

B. OWNER will assist CONTRACTOR in locating local sources.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 PHOTOGRAPHIC DOCUMENTATION

A. CONTRACTOR shall take photographs at a sufficient frequency to document the site condition before work, the work performed, and the condition of the site after work is completed.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Methods for measuring and calculating quantities.

B. Basis of payment for all contract bid items.

C. Values of unit prices.

D. Description for payment of extra work or changes.

E. Discussion of payment for rejected materials.

F. Description of payment for force account work.

G. Summary of all contract bid items.

1.2 MEASUREMENT

A. Performed according to United States Standard Measure.

B. Based on actual units installed or neat line dimensions of work completed.

1.3 CALCULATION OF QUANTITIES

A. Progress Payment Quantities:
   1. CONTRACTOR will compute all quantities of Work performed, or of materials and equipment delivered to the site for progress payment purposes.
   2. OWNER may at any time verify quantities calculated by CONTRACTOR.

B. Final Payment Quantities: CONTRACTOR will compute all quantities of Work performed, or of materials and equipment delivered to the site for final payment purposes. Calculation of final quantities will be as described in Article 1.9.

C. Submit calculations and other documentation of final installed quantities with application for final payment.

1.4 PAYMENT

A. In accordance with lump sum, unit price, or force account rates provided on the Contract Documents. Includes all costs for overhead and profit and for supplying materials, labor, equipment, tools, necessary to complete the Work in accordance with the Specifications, Construction Drawings, and Contract Conditions.

B. Unless specifically mentioned to the contrary, CONTRACTOR shall be responsible for obtaining and cost of, all permits and city and state fees to carry out the work.

1.5 QUANTITIES

A. The number of units and quantities contained in the Bid Schedule are approximate only, and final payment will be made for the actual number of units and quantities incorporated in the work or made necessary to complete the project.

B. In the event that work and materials or equipment are required to be furnished to a greater or lesser extent than is indicated by the Contract Documents, such work and materials or equipment will be furnished in greater or lesser quantities.

1.6 CHANGES AND EXTRA WORK

A. Changes and extra work will be measured and paid for in accordance with the requirements of this Section.

1.7 REJECTED MATERIALS

A. Quantities of material wasted or disposed in a manner not called for in the Specifications; rejected loads of material, including material rejected after it has been placed by reasons of the failure of CONTRACTOR to conform to the provisions of the Specifications; material not unloaded from the transporting vehicle; material placed outside the limits indicated by the Construction Drawings or established by OWNER; or material remaining on hand after completion of the Work, will not be paid for, and such quantities will not be included in the final total quantities. No compensation will be permitted for loading, hauling, and disposing of rejected material.

1.8 FORCE ACCOUNT WORK

A. Payment for Force Account work will be determined as follows:
   1. Labor:
      a. Payment for labor will be based on the Force Account Labor Rate Schedule submitted with the bid.
      b. Payment constitutes full compensation for labor including wages, benefits, overhead, and profit for each individual.
   2. Equipment:
      a. Payment for equipment will be based on the Force Account Equipment Rate Schedule submitted with the bid.
      b. Payment constitutes full compensation for supplying equipment and includes all costs for maintenance, fuel, insurance, overhead, profit and any other costs necessary to provide and operate the equipment. Payment does not include operator labor cost.
   3. Materials:
      a. Payment for materials will be paid for at cost plus 10 percent.
      b. Payment will be based on invoices from suppliers indicating full cost to CONTRACTOR.
      c. Where invoices are not available a unit cost must be approved by the OWNER prior to use of the material.

1.9 MEASUREMENT AND PAYMENT CONTRACT BID ITEMS

A. Bid Items
   1. Performance Bond
      a. Basis of Measurement: By the Lump Sum (LS).
      b. Basis for Payment: Includes all costs to secure and provide a Performance Bond to continue the project through Phase 1, Change Order 8.

   2. Statutory Payment Bond
      a. Basis of Measurement: By the Lump Sum (LS).

b. Basis for Payment: Includes all costs secure and provide a Statutory Payment Bond to continue the project through Phase 1, Change Order 8.

~~3. Mobilization & Demobilization~~

~~a. Basis of Measurement: By the Lump Sum (LS).~~

~~b. Payment as follows: 25 percent of lump sum amount upon completion of 10 percent of the work. 50 percent payment upon completion of 50 percent of the work. 25 percent upon completion of the work. Payment includes all costs for mobilizing and demobilizing equipment, living expenses, bonds, insurance, office and field overhead, clearing of materials and equipment associated with the project prior to demobilization, and any other administrative cost necessary to complete the work including work described in Division 1 of the technical specifications.~~

~~4. Surveying~~

~~a. Basis of Measurement: By the Lump Sum (LS).~~

~~b. Basis for Payment: Includes all costs to perform surveys to establish pre-construction conditions, layout and control work, measure installed quantities, and to document as-built conditions as described in Section 01052 and 01700.~~

~~5. Erosion and Sediment Control~~

~~a. Basis of Measurement: By the Lump Sum (LS).~~

~~b. Basis for Payment: Includes all costs to install and maintain for the duration of the project the erosion and sediment control measures as described in the construction drawings. Also includes procedures for managing runoff from active construction areas.~~

~~6. Site Preparation~~

~~a. Basis of Measurement: By the Lump Sum (LS)~~

~~b. Basis for Payment: Includes all costs for clearing and grubbing vegetation, removing fences, concrete curbs, walls and slabs necessary to construct reactor vault (except those portions of concrete slab required for existing groundwater treatment equipment), and removal of asphalt necessary to establish a soil stockpile area for material excavated under Bid Item 15. Also includes all costs to establish site entrance and exit facilities and all other temporary works needed to complete the work. Site preparation should be limited to those activities required to perform the rest of the work. Cost shall include all costs to remove from the site and dispose all items and materials removed under this item.~~

~~7. Excavation, Shoring, Dewatering, and Soil Management Plan (LS)~~

~~a. Basis for measurement: By the Lump Sum~~

~~b. Basis for Payment: Includes preparation of a plan documenting the design of the shoring and dewatering systems, including the dewatering treatment system. Also includes the excavation plan for the reactor vault foundation excavation, gravel window excavations, soil stockpile area design, and erosion and sediment control measures for stabilizing or covering the soil stockpile following completion of soil excavation.~~

~~8. Temporary Shoring~~

~~a. Basis of Measurement: By the Lump Sum (LS).~~

~~b. Basis for Payment: Includes all costs to design, permit, install, maintain, and remove temporary shoring. Shoring to be installed to an elevation of -5 ft NAVD 88, with a tolerance of plus or minus 0.5 ft, to achieve an embedment of approximately 3 feet into a low permeability silt layer. See Technical Memorandum dated July 27, 2009 for additional details.~~

~~9. Dewatering Within Excavation Including Piping to Surge Tanks~~

~~a. Basis of Measurement: By the Lump Sum (LS).~~

b. Basis for Payment: Includes all costs to remove ground water from within the shoring to maintain groundwater a minimum of 3 ft below the bottom of the excavation at all times during the construction of the ZVI Reactor Vault and to enable the drainage windows to be constructed. Cost for dewatering to be based on assumption that dewatering will be possible using sumps. Assume residual steady state seepage into excavation is less than 5 gallons per minute. Assume that all water from the excavation will be pumped into surge tank, and that no treatment will be required other than sediment removal through settling in the surge tank. See Technical Memorandum dated July 27, 2009 for additional details.

10. Installation of Deep Groundwater Extraction Wells and Piping to Surge Tanks
   a. Basis of Measurement: By the Lump Sum (LS).
   b. Basis for Payment: Includes all costs to permit, install, maintain, and decommission (in accordance with Washington Administrative Code (WAC) 173-160-460: "*Decommissioning of Resource Protection Wells*") after construction of the ZVI reactor vault, deep groundwater extraction wells in accordance with Technical Memorandum dated July 27, 2009. Item also includes costs to provide discharge piping from groundwater extraction wells to the surge tank, with a valved bypass directly to the site discharge location.

11. Installation of Piezometer.
   a. Basis of Measurement: By the Lump Sum (LS).
   b. Basis for Payment: Includes all costs to install, maintain, and decommission (in accordance with WAC 173-160-460: "*Decommissioning of Resource Protection Wells*") after construction of the ZVI reactor vault, a piezometer in accordance with the Technical Memorandum dated July 27, 2009. Piezometer to be used to assess the operation of the deep groundwater extraction wells.

12. Operation of Deep Groundwater Extraction Wells
   a. Basis of Measurement: By the Day (DAY).
   b. Basis for Payment: Includes all costs to operate the deep groundwater extraction wells, to ensure that, during excavation and construction of the ZVI reactor vault, the piezometric elevation in Layer D, as measured in the piezometer installed under Bid Item 11 does not exceed +11 ft NAVD 88. This item also includes pumping of water to surge tank or the site discharge point. Assume no treatment of extracted groundwater required. See Technical Memorandum dated July 27, 2009 for additional details.

13. Provision of Surge Tanks and Piping to Discharge Location
   a. Basis of Measurement: By the Lump Sum (LS).
   b. Basis for Payment: Includes all costs to permit, supply and locate at the site a temporary surge tank with a minimum capacity of 20,000 gallons. Costs shall include providing discharge piping from the surge tank to the site discharge connection to the sanitary sewer. Costs shall also include removal of sediment from the tank as needed. Note that piping into the surge tank is covered under Bid Items 9 and 10. Surge tank shall be capable of discharging at a rate of 100 gallons per minute. Tank shall be maintained on site while pumping is required under Bid Items 9 and 12, then removed.

14. Discharge of Groundwater to Sanitary
   a. Basis of Measurement: By the Lump Sum (GAL).

~~b. Basis for Payment: Includes all costs to discharge groundwater to sanitary sewer either from the surge tanks, or directly from the deep groundwater extraction wells through a valved line that bypasses the surge tank (see Bid Item 10). Costs should include the disposal fee charged by King County (assumed to be $0.00685 per gallon). Assume that no treatment of the extracted groundwater will be required other than primary settling in the surge tank. Bid quantity based on the shallow and deep dewatering systems operating for 30 days at average pumping rates of 5 and 60 gallons per minute (gpm), respectively. See Technical Memorandum dated July 27, 2009 for additional details.~~

~~15. Excavation for Reactor Vault Foundation (to Onsite Stockpile)~~

~~a. Basis of Measurement: By the Cubic Yard (CY) based on preconstruction and as-built surveys.~~

~~b. Basis for Payment: Includes all costs to perform the excavation required to excavate soil to the subgrade lines and grades shown on the Construction Drawings and as described in Section 02221 and to haul and place soil in the Owner-designated stockpile location.~~

~~16. Construction of Gravel Windows Below Reactor Vault Foundation~~

~~a. Basis of Measurement: By the Cubic Foot (CF) based on neat line measure.~~

~~b. Basis for Payment: Includes all costs to excavate the gravel windows and trenches below the ZVI Reactor Vault foundation, place the excavated soil in the Owner-designated on-site stockpile location, line the faces of the excavations with non-woven separator geotextile, and backfill windows and trenches with drainage gravel (per Section 02225), and place 4-inch diameter perforated HDPE pipe in the trenches as shown on the Construction Drawings.~~

~~17. Reactor Vault Base and Walls Construction~~

~~a. Basis of Measurement: By the Lump Sum (LS).~~

~~b. Basis for Payment: Includes all costs to construct the ZVI Reactor Vault including the crushed gravel bedding layer, forming and constructing reinforced concrete foundation slab, and walls, including water stops, as shown on the Construction Drawings and as described in Sections 031513, 033000, and 051513.~~

18. Complete Link-Seal Penetrations in Reactor Vault
    a. Basis of Measurement: By the Each (EA).
    b. Basis for Payment: Includes all costs to complete supply and installation of the link-seal penetrations between chambers and inlet and outlet penetrations, as shown on the Construction Drawings.

19. Complete Reactor Vault Lid Construction
    a. Basis of Measurement: By the Each (EA).
    b. Basis for Payment: Includes all costs to complete construction of the ZVI Reactor Vault lids including hatches, sampling covers, and lifting points, and delivering lids to the site for installation, as shown on the Construction Drawings and as described in Sections 031513, 033000, and 051513.

20. Complete Reactor Vault Lid Installation
    a. Basis of Measurement: By the Each (EA).
    b. Basis for Payment: Includes all costs to complete installation of the ZVI Reactor Vault lids including all gaskets and sealants required to properly seal the lids to the walls as shown on the Construction Drawings and as described in Sections 031513, 033000, and 051513.

~~21. Complete Water Proofing~~

~~a. Basis of Measurement: By the Square Foot (SF). Based on actual vertical area of the external wall surface area of the ZVI Reactor Vault~~

~~b. Basis for Payment: Includes all costs to complete supply and installation of sealant and protective materials required on the external walls of the ZVI Reactor Vault as shown on the Construction Drawings.~~

22. Complete Reactor Vault Inlet and Outlet Valves
    a. Basis of Measurement: By the Lump Sum (EA).
    b. Basis for Payment: Includes all costs to complete furnishing and installation of inlet and outlet valves, and all associated fittings as shown and described on the construction drawings, including supporting platforms for the valves to be fixed to the inside walls of the inlet and outlet chambers in the ZVI Reactor Vault. Includes submitting shop drawings of proposed supporting platforms for Owner review.

23. Complete Piping
    a. Basis of Measurement: By the Lump Sum (LS).
    b. Basis for Payment: Includes all costs to complete furnishing and installation of internal and external HDPE piping and fittings for the ZVI Reactor Vault. Includes piping at two elevations around the vault, piping on bottom of each chamber, vertical riser pipes, pipe sleeves through Link-Seal penetrations, and all associated fittings, as indicated on the Construction Drawings and as described in Section 02711.

24. Complete Drainage Gravel in Bottom of Reactor Vault Chambers
    a. Basis of Measurement: By the Lump Sum (LS).
    b. Basis for Payment: Includes all costs to complete furnishing and installation of the 8-inch thick layer of drainage gravel over the bottom of each chamber in the ZVI Reactor Vault, as shown on the Construction Drawings and as described in Section 02225.

25. Complete Geotextile Around Perimeter of Excavation
    a. Basis of Measurement: By the Square Foot (SF). Based on actual vertical area of the excavation.
    b. Basis for Payment: Includes all costs to complete furnishing and installation of geotextile separator around the perimeter of the excavation as shown on the Construction Drawings and as described in Section 02771. No allowance will be made for overlap or anchoring the geotextile at the bottom of the excavation. Contractor responsible for ensuring geotextile is continuous and not damaged during the removal of temporary shoring.

26. Complete Drainage Gravel Around ZVI Reactor Vault
    a. Basis of Measurement: By the Cubic Yard (CY). Based on neat line measure of the dimensions shown on the construction drawings.
    b. Basis for Payment: Includes all costs to complete furnishing and placing drainage gravel around the outside of the ZVI Reactor Vault, including placement around piping as indicated on the Construction Drawings, and as described in Section 02225.

27. 2011 Remobilization & Demobilization
    a. Basis of Measurement: By the Lump Sum (LS).
    b. Payment as follows: 25 percent of lump sum amount upon completion of 10 percent of the work. 50 percent payment upon completion of 50 percent of the work. 25 percent upon completion of the work. Payment includes all costs for remobilizing and demobilizing equipment, living expenses, insurance, office and field overhead, cleaning of materials and equipment associated with the project prior to demobilization, and any other administrative cost necessary to complete the work associated with Phase 1 work and Change Order 8, including work described in Division 1 of the technical specifications.

28. 2011 Surveying for ZVI Reactor Vault
    a. Basis of Measurement: By the Lump Sum (LS).
    b. Basis for Payment: Includes all costs to complete surveys associated with the construction of the ZVI Reactor Vault to establish pre-construction conditions, layout and control work, measure installed quantities, and to document as-built conditions as described in Section 01052 and 01700.

29. 2011 Erosion and Sediment Control for ZVI Reactor Vault
    a. Basis of Measurement: By the Lump Sum (LS).
    b. Basis for Payment: Includes all costs to install and maintain for the duration of the construction of the ZVI Reactor Vault the erosion and sediment control measures as described in the construction drawings and any other required measures required by Contractor's proposed construction methods.

30. 2011 Excavation, Shoring, Water Management and Tremie Concrete Placement Plan (LS)
    a. Basis for measurement: By the Lump Sum
    b. Basis for Payment: Includes preparation of a plan documenting the installed configuration of the shoring system and a plan for the excavation and construction of the tremie concrete base slab, and concurrent management of water within the excavation, and management of water from the excavated soils both in the soil stockpile and in transit between the excavation and the soil stockpile.

31. 2011 Temporary Shoring
    a. Basis of Measurement: By the Lump Sum (LS).
    b. Basis for Payment: Includes all costs to maintain, and remove previously installed temporary shoring.

32. 2011 Manage Water Within the Excavation for ZVI Reactor Vault
    a. Basis of Measurement: By the Lump Sum (LS).
    b. Basis for Payment: Includes all costs to manage water within the excavation, including: (i) maintain the level of water within the excavation to within 6 ft of the ground surface until after the excavation has been completed and the base slab has been constructed using the tremie method, (ii) dewater the excavation after the tremie base slab has been constructed, (iii) treat the water to remove sediment to achieve water quality parameters suitable for discharge to sanitary sewer, (iv) provide sufficient on site storage for water removed from excavation, (v) discharge treated water to sanitary sewer at a maximum rate of 100 gallons per minute, including the disposal fee charged by King County (assumed to be $0.00685 per gallon), (vi) removal of sediment from the site and temporary storage tanks generated from the treatment of water removed from the excavation, (vii) cleaning and preparing the surface of the tremie concrete slab after dewatering the excavation, and (viii) removing seepage water during construction of vault consistent with the requirements of each component of construction

33. 2011 Excavation for Reactor Vault Foundation (to On-Site Stockpile)
    a. Basis of Measurement: By the Cubic Yard (CY) based on preconstruction and as-built conditions.
    b. Basis for Payment: Includes all costs to complete excavation required to reach the design grade for the tremie concrete base slab shown on the Phase I Construction Drawings issued with Change Order 8 and as described in Section 02221 and to haul and place soil in the Owner-designated on-site stockpile location.

34. 2011 Construction of Concrete Base Slab By Tremie Method
    a. Basis of Measurement: By the Cubic Yard (CY) based on preconstruction and as-built conditions defined by the horizontal and vertical limits of the poured concrete.

b. Basis for Payment: Includes all costs to: (i) furnish and install, by the tremie method, the mass concrete slab below the Reactor Vault, as shown on the Phase I Construction Drawings issued with Change Order 8, and as Described in Section 03301 and as defined in the Excavation, Shoring, Water Management and Tremie Concrete Placement Plan, and (ii) after water has been removed from the excavation according to Bid Item 32, furnish and install a leveling screed on the surface of the tremie concrete at the design top of concrete elevation to provide a flat surface for the construction of the vault foundation slab and waterproofing materials.

35. 2011 Reactor Vault Base and Walls
    a. Basis of Measurement: By the Lump Sum (LS).
    b. Basis for Payment: Includes all costs to construct the ZVI Reactor Vault including forming and constructing reinforced concrete foundation slab, and walls, including water-stops, as shown on the Phase I Construction Drawings issued with Change Order 8, and as described in Sections 031513, 033000, and 051513.

36. 2011 Reactor Vault Electrical Outlet
    a. Basis of Measurement: By the Lump Sum (LS).
    b. Basis for Payment: Includes all costs to install a dual 110 volt receptacle in the outlet chamber of the Reaconstruct the ZVI Reactor Vault at the location shown on the the Phase I Construction Drawings issued with Change Order 8, with all necessary below grade conduit, wiring, connections, and permits to connect to existing on site power supply.

37. 2011 Reactor Vault Discharge Line
    a. Basis of Measurement: By the Lump Sum (LS).
    b. Basis for Payment: Includes all costs to install a 2-inch diameter discharge line from the outlet chamber of the Reactor Vault, at the location shown on the Phase I Construction Drawings issued with Change Order 8, to the existing on site discharge line discharging to the existing sanitary sewer.

38. 2011 Reactor Vault Water Proofing
    a. Basis of Measurement: By the Lump Sum (LS).
    b. Basis for Payment: Includes all costs to complete supply and installation of water proofing materials protective materials required on the external walls and base of the ZVI Reactor Vault as shown on the Construction Drawings, and as described in Section 071716.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01027

APPLICATIONS FOR PAYMENT

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Procedures for preparation and submittal of applications for payment.

1.2 RELATED SECTIONS

A. Section 01035 - Modification Procedures

B. Section 01300 - Submittals

C. Section 01700 - Contract Closeout

1.3 FORMAT

A. A computer generated spreadsheet. For each bid item and change order item, provide a column listing each of the following:
   1. Item number
   2. Description of work
   3. Unit
   4. Contract quantity
   5. Contract unit price
   6. Contract amount
   7. Previous quantity
   8. Previous amount
   9. Quantity for current period
   10. Amount for current period
   11. Quantity to date
   12. Amount to date
   13. Percentage complete for each item
   14. Summary of quantities and values of materials on hand

B. Provide a summary that includes the following:
   1. Total earned in current month.
   2. Total previously earned.
   3. Total earned to date.
   4. Total value of materials on hand.
   5. Total for items 3 and 4.
   6. Amount retained.
   7. Summary of previous payment.
   8. Amount due for current period.
   9. Remaining Balance.

1.4 PREPARATION OF APPLICATIONS

A. Present required information on electronic media printout.

B. Execute certification by signature of authorized officer.

C. Provide dollar value in each column for each line item for portion of work performed.

D. Prepare Application for Final Payment as specified in Section 01700.

1.5 SUBMITTAL PROCEDURES

A. Submit three signed copies of each Application for Payment.

B. Payment Period: Submit at intervals stipulated in the Agreement.

1.6 SUBSTANTIATING DATA

A. When OWNER requires substantiating information, submit data justifying quantities or dollar amounts in question.

B. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01030

ALTERNATES

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Submission procedures.

B. Documentation of changes to Contract Sum/Price and Contract Time.

1.2 RELATED SECTIONS

A. Section 01300 - Submittals

B. Section 01310 - Construction Schedule

C. Section 01600 - Material and Equipment

D. Section 01630 - Product options and substitutions

1.3 SUBMISSION REQUIREMENTS

A. Submit Alternates identifying the effect on adjacent or related components.

B. Submit requests using the Request for Information (RFI) form. Specify any cost differences (breakout into labor, material, equipment, etc).

C. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at the OWNER's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

D. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.4 SELECTION AND AWARD OF ALTERNATES

A. Indicate variation of Bid Price for Alternates in the form described below and list on a supplemental bid form.

B. Bids may be evaluated on the base bid price. After determination of a bidder, consideration will be given to Alternates and Bid Price adjustments.

1.5 FORM FOR SUBMITTING

A. Alternate No. 1 - Title:
Base Bid Item: Section [_____] and Drawing number [_____] including [_____].
Alternate Item: Section [_____] and Drawing number [_____] including [_____].

B. Alternate No. 2 - Title:
Base Bid Item: Section [_____] and Drawing number [_____] including [_____].
Alternate Item: Section [_____] and Drawing number [_____] including [_____].

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01035

MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Field Orders.

B. Work Change Directives.

C. Change Orders.

1.2 CHANGE PROCEDURES

A. OWNER will issue Field Orders for minor changes in the Work not involving an adjustment to Contract Price or Contract Time. OWNER will maintain a numbered log of Field Orders.

B. OWNER may issue a Proposal Request which includes a detailed description of a proposed change with supplementary or revised Construction Drawings and Specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required, and the period of time during which the requested price will be considered valid. CONTRACTOR must prepare and submit a Proposal with estimate within 5 days.

C. CONTRACTOR may request a change by submitting a Proposal to OWNER, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, the effect on the Contract Price and Contract Time, and a statement describing the effect on Work by separate or other contractors. Changes must include breakdown into labor, materials, equipment, services, permits, etc.

D. OWNER may issue a Work Change Directive for any change that, if not processed expeditiously, might delay the Project. This is not a Change Order, but only a directive to proceed with Work that may or may not result in a Change Order and be included in a subsequent Change Order.

E. Changes affecting Contract Price or Contract Time, resulting under Articles 1.2 B, C, and D of this Section, will be processed as a Change Order. CONTRACTOR shall not proceed with work without prior written authorization from the OWNER.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01042

RESTORATION OF SURFACES

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Roads and Streets.

B. Curbs, Driveways and Sidewalks.

C. Material Storage and Processing Areas.

D. Measurement and Payment.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control

B. Section 01700 - Contract Closeout

1.3 ROADS AND STREETS

A. The Contractor shall restore all roads and streets in which the surface is removed, broken or damaged, or in which the ground has caved or settled due to the performance of work covered by this contract.

B. The Contractor shall match the existing surfacing for depth, materials and surface finish, including striping and pavement markings, except as otherwise specified.

1.4 CURBS, DRIVEWAYS AND SIDEWALKS

A. The Contractor shall reconstruct to the same specifications of the original work all curbs, driveways, sidewalks and similar structures which are broken or damaged during construction.

B. The Contractor shall remove and replace the entire damaged portions between joints or scores.

C. The Contractor shall match the appearance of the existing improvements as nearly as possible, except as otherwise required.

1.5 MATERIAL STORAGE AND PROCESSING AREAS

A. Materials storage and processing areas utilized by the Contractor shall be graded to drain at a minimum slope of 2 percent at the conclusion of the project.

1.6 MEASUREMENT AND PAYMENT

A. No separate or additional payment will be made for restoration of surfaces.

B. The costs for restoration of surfaces shall be considered incidental to the work and shall be included in various unit or lump sum bid items.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01052

LAYOUT OF WORK AND SURVEYS

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Setting offset stakes, slope stakes, and grade stakes for field layout of features for performance of the Work.

B. Surveys for measurement of quantities for payment.

C. Record (as-built) surveys.

1.2 DESCRIPTION

A. Reference Points. Reference points provided by the OWNER will include monuments and elevation benchmarks in the vicinity of the Project. If displaced, replacement of these reference points will be at the expense of the CONTRACTOR.

B. Equipment and Personnel. Provide instruments and other survey equipment that is accurate, suitable for the surveys required in accordance with recognized professional standards, and in proper condition and adjustment at all times. (Perform surveys under the direct supervision of a Washington State licensed surveyor.)

C. Field Notes and Records. Record surveys in field notebooks and retain copies. Electronic notes may be used if printouts are retained.

D. Use by the OWNER. The OWNER may at any time use line and grade points and markers that have been established by the CONTRACTOR. The CONTRACTOR's surveys are a part of the Work and may be checked by the OWNER or representatives of the OWNER at any time. The CONTRACTOR is responsible for (1) any lines, grades, or measurements that do not comply with specified or proper tolerances, or which are otherwise defective, and (2) for any resultant defects in the Work. The CONTRACTOR is required to conduct re-surveys or check surveys to correct errors indicated by review of the field notebooks or otherwise detected.

1.3 SURVEYS FOR LAYOUT AND PERFORMANCE OF WORK

A. Perform surveys for layout and performance of the Work, reduce the field notes, make necessary calculations, and prepare drawings necessary to carry out such work.

1.4 SURVEYS FOR RECORD DRAWINGS

A. When the Specifications require as-built conditions of items of work to be documented by surveying methods, the CONTRACTOR will perform the surveys. The OWNER may perform independent checks. Surveys shall use benchmarks, datum, and controls indicated on the construction drawings, unless agreed to in writing by the OWNER.

B. Provide record (as-built) surveys for the following items:
   1. Horizontal and vertical location of reactor vault, including limits of tremie slab, reactor vault base, walls, inlet and outlet, and connections between chambers. Clearly distinguish between value labels (i.e., "vault inlet" and "vault outlet").
   2. Location of 100 V electrical feed to Reactor Vault.
   3. Location of 2-inch diameter contingency discharge liner from Reactor Vault to existing sanitary sewer connection.

4. Topographic survey of soil stockpile, at sufficient detail to accurately determine volume of stockpile.

1.5 SURVEYS FOR MEASUREMENT FOR PAYMENT

A. When the Specifications require quantities of work to be measured by surveying methods, the CONTRACTOR will perform the surveys. The OWNER may perform independent checks.

B. Provide surveys to measure final quantities of items listed in Section 01025.

1.6 SURVEYING ACCURACY AND TOLERANCES IN SETTING OF SURVEY STAKES

A. Perform control traverse field surveys and computations to an accuracy of at least 1:10,000.

B. The tolerances applicable in setting survey stakes are set forth below. Such tolerances do not supersede stricter tolerances required by the Construction Drawings or Specifications, and do not otherwise relieve the CONTRACTOR of responsibility for measurements in compliance therewith.

Type of Mark	Horizontal Position	Elevation
Permanent reference points	1 in 10,000	±0.01 ft.
General excavation and earthwork	1 in 2,000	±0.10 ft.

C. Tolerances for design thickness indicated on Construction Drawings and for elevations indicated on the Construction Drawings are ±0.10 foot unless otherwise specified.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01060

CODES, PERMITS AND PREVENTION OF ENVIRONMENTAL DEGRADATION

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Contractor Responsibility.

B. Protection of Land Resources.

C. Water Pollution.

D. Protection of Fish and Wildlife.

E. Permits.

F. Dust Control.

G. Subcontractors.

H. Non-Compliance.

I. Payment.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control

B. Section 01560 – Temporary Controls

C. Section 01700 - Contract Closeout

1.3 CONTRACTOR RESPONSIBILITY

A. It is the responsibility of the Contractor to apply for and obtain all necessary trade permits. All permits shall be posted at the job site and all signed permits shall be submitted (originals) to owner within 5 days of receipt.

B. Environmental pollution control shall consist of the protection of the environment from pollution during and as a result of construction operations under the contract.

C. The control of environmental pollution requires the consideration of air, water and land and involves noise, dust, and other pollutants.

D. It is the responsibility of the Contractor to investigate and comply with all applicable federal, state, and county laws and regulations concerning environmental pollution control and abatement.

1.4 PROTECTION OF LAND RESOURCES

A. Land resources within the project area and outside the limits of permanent work performed under the Contract shall be preserved in their present condition or be restored to a natural condition that will not detract from the surroundings.

B. Except in areas marked on the drawings to be cleared, the Contractor shall not deface, injure or destroy trees or shrubs nor remove or cut them without approval by the owner.

C. Any tree or other landscape feature scarred or damaged by the Contractor's equipment or operation shall be restored as nearly as possible to its original condition at the Contractor's expense.

1.5 WATER POLLUTION

A. Contractor shall keep spill prevention and cleanup kits onsite in order to respond to any inadvertent releases.

B. The Contractor shall not pollute water resources, including streams and drainage systems, with fuel, oils, bituminous materials, bentonite, soil, calcium chloride, acids, construction wastes, wash waters, or other harmful materials.

C. Objectionable construction discharges shall be processed, filtered, ponded, or otherwise treated prior to their discharge into a waterway or drainage system.

D. Disposal of any garbage, oil, grease, chemicals, trash, or other similar materials in areas adjacent to streams or drainage systems is prohibited.

1.6 PROTECTION OF FISH AND WILDLIFE

A. The Contractor shall at all times perform all work and take such steps to prevent any interference or disturbance to fish and wildlife.

1.7 PERMITS

A. The Contractor shall be responsible for obtaining building, electrical, and all other permits necessary for completing the work.

1.8 DUST CONTROL

A. The Contractor shall maintain all embankment, excavation, stockpile, and all other work within or adjoining the project site free from dust which would cause a hazard or nuisance.

B. Sprinkling, chemical treatment, bituminous treatment, or similar methods may be necessary to control dust

C. The Contractor shall have suitable and sufficient equipment present on the job to accomplish this work.

1.9 SUBCONTRACTORS

A. Compliance with the provisions of this Section by the subcontractors will be the responsibility of the Contractor.

1.10 NON-COMPLIANCE

A. The Engineer will notify the Contractor of any non-compliance with the forgoing provisions and the action to be taken.

B. If the Contractor fails or refuses to comply promptly, the Owner, may issue an order stopping all or part of the work until satisfactory corrective action has been taken.

C. No extension of time or payment for excess costs or damage shall be made to the Contractor for the time lost due to such stop action.

D. Failure to notify does not change the requirements.

1.11 PAYMENT

A. No separate or additional payment will be made for preparing and implementing the dust control plans and for codes, permits, and prevention of environmental degradation, but shall be considered incidental to the work and shall be included in various unit or lump sum bid items.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01070

SAFETY PROVISIONS

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. General.

B. Warning.

C. Site Safety and Health Plan.

D. Contractor Safety Equipment.

E. Site Safety and Health Officer.

F. Payment.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control

B. Section 01700 - Contract Closeout

1.3 GENERAL

A. All required safety posters shall be properly and prominently displayed for site personnel to review.

B. The Contractor shall comply with all health and safety rules, regulations, and ordinances promulgated by the local, state, and federal governments, the various construction permits, and other Sections of the Contract Documents. The Contractor shall determine the specific requirements for safety provisions and shall cause inspections and reports by the appropriate safety authorities to be conducted to insure compliance with the intent of the regulations.

C. The Contractor shall perform whatever work is necessary for safety and be completely responsible for the conditions of the job site, including the safety of all persons and property during the contract period. This requirement applies continuously and is not limited to normal working hours.

D. Contractor shall provide for the protection of employees and others from fire, explosion, or asphyxiation caused by any gases encountered during construction.

E. Contractor shall provide at all times proper facilities for safe access to the work by authorized government officials.

F. Accidents causing death, injuries, or damage must be reported to the engineer immediately in person or by telephone or messenger. In addition, Contractor shall promptly report in writing to the engineer all accidents whatsoever arising out of, or in connection with, the performance of the work whether on, or adjacent to, the site, giving full details and statements of witness.

G. If a claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing within twenty-four (24) hours after occurrence, to the engineer, giving full details.

1.4 WARNING

A. The Contractor is entirely responsible for the health and safety of all contractor personnel on the project site.

1.5 SITE SAFETY AND HEALTH PLAN

A. The Contractor shall develop and maintain for the duration of this Contract, a site safety and health plan that will effectively incorporate and implement all required county, state, and federal safety provisions.

B. Contractor shall provide a written site-specific safety and health plan for the construction, which must be approved by the owner, within ten (10) calendar days after receiving a Notice to Proceed and prior to commencing work on this project. Contractor shall maintain at least one copy of the plan at the work site.

C. Contractor shall assign an individual serving as a Site Safety and Health Officer at the job site at all times during work that is responsible and authorized to supervise and enforce compliance with the site safety and health plan. The Site Safety and Health Officer may have other assigned duties.

D. In addition to the other items that shall be addressed, the site safety and health plan shall list the appropriate procedures to be followed in the event that hazardous wastes are encountered.

E. Preparation of the written site safety and health plan is the Contractor's responsibility, and no statement made in these provisions relieves the Contractor of responsibility for information included in, and implementation of, the site safety and health plan.

F. The Contractor's written site safety and health plan should include, but not be limited to:
   1. A list of chemical and physical hazards, allowable OSHA exposure levels, threshold limit values, other regulatory exposure levels, and the emergency response should an exposure or injury occur.
   2. A map showing directions to the nearest hospital.
   3. An emergency evacuation plan for immediate removal to the nearest hospital or a doctor's care of any person who may be injured on the job site including evacuation plan routes to medical treatment, and emergency telephone numbers including hospital, ambulance, fire, sheriff/police, poison control, the Engineer, and others as deemed necessary.
   4. A list of safety and monitoring equipment at the job site and locations where equipment is stored or expected to be maintained.
   5. Monitoring equipment action levels, frequency of testing, and recommended responses.
   6. Procedures for entering confined spaces.
   7. Procedures to be followed if hazardous waste is encountered.
   8. Procedures for lockout/tagout.
   9. Conditions when the reactor vault excavation is filled with water during excavation and tremie concrete placement.

G. The Contractor shall submit copies of the site safety and health plan in accordance with Section 00650 of the Project Manual.

H. Failure on the part of the Contractor to follow the site safety and health plan or failure to work in a safe manner may result in suspension of the work by the Owner.

I. The Contractor shall not be entitled to extra compensation for health- and safety-related suspensions, nor shall the Contract completion date be extended.

1.6 CONTRACTOR SAFETY EQUIPMENT

A. As a part of the safety program, the Contractor shall maintain at the job site safety equipment applicable to the work as prescribed by the governing safety authorities and all articles necessary for giving first aid to the injured.

B. The Contractor shall train all personnel in use of the appropriate safety equipment that would be utilized during the course of their work.

C. It is the responsibility of the Site Safety and Health Officer to ascertain that all safety equipment is properly maintained and being used when appropriate.

1.7 SITE SAFETY AND HEALTH OFFICER

A. The Contractor shall provide a person designated as the Site Safety and Health Officer who is Red Cross certified in CPR and thoroughly trained in rescue procedures and the use of safety equipment. The Site Safety and Health Officer must be present at all times while work is being performed, and implement the written site safety and health plan and conduct testing as necessary.

B. The Contractor shall provide the Site Safety and Health Officer with the delegated authority to order any person or worker on the site to follow the safety rules. Failure to observe these rules is sufficient cause for removal of the person or worker from this project.

C. The Site Safety and Health Officer is responsible for determining the extent to which any safety equipment must be utilized, depending on conditions encountered at the site.

1.8 PAYMENT

A. No separate or additional payment will be made for safety provisions, but shall be considered incidental to the work and shall be included in various unit or lump sum bid items.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01090

REFERENCES

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. References and abbreviations of various industry associations, trade associations, societies, organizations, and regulatory agencies, as referenced in the Contract Documents.

1.2 DESCRIPTIONS

A. The Contract Documents contain references to various standard Specifications, codes, practices, and requirements for materials, workmanship, installation inspections, and tests, which references are published and issued by the organizations, societies, and associations listed below by abbreviation and name. Such references are hereby made a part of the Contract Documents to the extent cited.

B. Any material, method, or procedure specified by reference to the number, symbol, or title of a specific Specification or standard, such as a Commercial Standard, American National Standard, Federal or State Specification, Industry or Government Code, a trade association code or standard, or other similar standard, must comply with the requirements of the edition in effect on the date of Bid Opening or the date the Contract Documents are signed.

C. The code, specification, or standard referred to, except as modified in these Specifications, will have full force and effect as though printed in these Specifications. These Specifications and standards are not furnished to BIDDERS since manufacturers and trades involved are assumed to be familiar with their requirements. OWNER will furnish, upon request; information as to how copies of the Specifications and standards referred to may be obtained.

1.3 ABBREVIATIONS

A. Whenever in the Contract the following abbreviations are used, their meanings shall be as follows:

ACI	American Concrete Institute
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASTM	ASTM International
CRSI	Concrete Reinforcing Steel Institute
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
PPI	Plastic Pipe Institute
UL	Underwriters Laboratories

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01200

PROJECT COORDINATION MEETINGS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDE:

A. Representatives of CONTRACTOR, subcontractors, and suppliers attending meetings must be authorized to act on behalf of the entity each represents.

1.2 PRE-CONSTRUCTION MEETING

A. Meeting will be held at a location selected by OWNER and will be administered by OWNER.

B. Attendance:
1. CONTRACTOR's Office Representative.
2. CONTRACTOR's On-Site Field Superintendent.
3. Any Subcontractors or Supplier's representatives whom CONTRACTOR may desire to invite or OWNER may request.
4. Design Engineer of Record.
5. OWNER's Representatives including Construction Manager.
6. CQA Engineer of Record.
7. CQA Monitor(s).
8. Safety Officer

C. A suggested format would include, but not be limited to, the following subjects:
1. Presentation of a proposed construction progress schedule and submittals as required by the Contract Documents.
2. Required bonds and insurance certifications prior to Notice to Proceed.
3. Liquidated Damages.
4. List of required submittals and procedures for handling submittals.
5. Direction of correspondence, and coordinating responsibility between CONTRACTOR, OWNER, Design Engineer of Record, and CQA Engineer of Record.
6. Location and schedule for weekly progress meetings.
7. Laboratory materials testing.
8. Applications for payment, and progress payment procedures.
9. Change Order procedures.
10. OWNER's site regulations.
11. Review the Construction Drawings, specifications, CQA Manual, work area security, Site Safety & Health Manual and related issues.
12. Provide all parties with relevant documents.
13. Review responsibilities for each party.
14. Define lines of communication and authority.
15. Establish reporting and documenting procedures.
16. Review testing equipment and procedures.
17. Establish CQC and CQA testing protocols and procedures for correcting and documenting construction or nonconformance.
18. Conduct a site inspection to discuss work area, stockpile areas, laydown areas, access roads, haul roads, and related items.

D. The meeting will be documented by the OWNER. Copies of the minutes and relevant documents will be provided to all parties within one week of the meeting.

1.3 WEEKLY PROGRESS MEETINGS

A. OWNER will schedule and administer progress meetings at a location agreed during the pre-construction meeting, or as otherwise agreed, a minimum of once per week, and such additional meetings as required.

B. Attendance:
   1. OWNER's representative.
   2. Design Engineer of Record or approved alternative.
   3. CQA Engineer of Record
   4. CQA Monitor.
   5. CONTRACTOR's on-site field superintendent.
   6. Subcontractors as appropriate to agenda.
   7. Suppliers as appropriate to agenda.

C. Meeting requirements:
   1. Administer following general requirements for progress meetings:
      a. Prepare agenda for meetings.
      b. Make physical arrangements for meetings.
      c. Preside at meetings.
      d. Record significant proceedings and decisions of meeting.
      e. Reproduce and distribute copies of meeting record within seven days after each meeting to participants in meeting and to parties affected by decisions made at meeting.

D. Suggested agenda:
   1. Review and approval of record of previous meeting.
   2. Review of work progress since previous meeting.
   3. Field observations, problems, and conflicts.
   4. Problems that impede work schedule.
   5. Review of off-site delivery schedules.
   6. Corrective measures and procedures to regain projected schedule.
   7. Revisions to construction progress schedule.
   8. Planned progress during work period.
   9. Coordination of schedules.
   10. Review submittal schedules; expedite as required.
   11. Maintenance of quality and safety standards.
   12. Pending changes and substitutions.
   13. Review proposed changes for effect on construction schedule and completion date, and on other contracts of projects.
   14. Application for payment.
   15. Other business.

1.4 DAILY PROGRESS MEETINGS

A. An informal daily progress meeting is suggested before the start of work. At a minimum, the CQA Monitor and CONTRACTOR will attend this meeting. The purpose of this meeting is to:
   1. Review scheduled work activities.
   2. Discuss problems and their resolutions.
   3. Review CQC and CQA test data.
   4. Discuss the CONTRACTOR's personnel and equipment assignments for the day.
   5. Review the previous day's activities and accomplishments.

B. The CQA Monitor will document this meeting in daily field reports.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Submittal procedures.

B. Proposed Products list.

C. Shop Drawings.

D. Product Data.

E. Samples.

F. Manufacturer's installation instructions.

G. Manufacturers' certificates.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control

B. Section 01700 - Contract Closeout

1.3 DEFINITIONS

A. Submittals for Review: Submittals requiring review and approval by OWNER, Design Engineer of Record, or CQA Engineer of Record.

B. Submittals for Information: Submittals provided for information only, no approval required.

1.4 SUBMITTAL PROCEDURES

A. Contractor to provide and maintain a Submittal Log of all required submittals as identified in the Contract Documents, including Specifications and Drawings.

B. Transmit each submittal with a transmittal form.

C. Sequentially number the transmittal form. For revised submittals add an alphabetic suffix to the original number.

D. Identify Project, CONTRACTOR, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate.

E. Apply CONTRACTOR's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.

F. Schedule submittals to expedite review by the Design Engineer of Record, CQA Engineer of Record, or others as determined by OWNER and deliver in the time frame specified PRIOR TO INCORPORATING INTO THE WORK. Coordinate submission of related items.

G. Allow 7 calendar days review time for each submittal excluding delivery time.

H. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

I. Provide space for CONTRACTOR and Design Engineer of Record and CQA Engineer of Record review stamps.

J. When revising and resubmitting, identify all changes made since previous submission.

K. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with provisions.

L. Submittals not requested will not be recognized or processed.

M. Items incorporated into the Work that have not been previously approved are at the risk of the Contractor. Any rejection shall be promptly removed from the Work at no cost to the Owner.

1.5 SHOP DRAWINGS

A. Submit the number of opaque reproductions that CONTRACTOR requires, plus 2 copies that will be retained by OWNER.

B. Shop Drawings: Submit for review. After review, produce copies and distribute in accordance with the SUBMITTAL PROCEDURES article above and for record documents purposes described in Section 01700 - CONTRACT CLOSEOUT.

1.6 PRODUCT DATA

A. Submit the number of copies that the CONTRACTOR requires, plus 2 copies that will be retained by the OWNER.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.

C. After review distribute in accordance with the SUBMITTAL PROCEDURES article above and provide copies for record documents described in Section 01700 - CONTRACT CLOSEOUT.

1.7 SOIL SAMPLE SUBMITTALS FOR REVIEW

A. Submit soil samples that represent proposed products. Coordinate sample submittals for interfacing work.

B. For each sample, submit in a bucket and provide at least 40 pounds.

C. Include identification on each sample, with full Project information.

D. Submit the number of samples specified in individual specification sections. OWNER will retain one.

1.8 MANUFACTURER INSTALLATION INSTRUCTIONS

A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to OWNER in quantities specified for Product Data.

B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.9 MANUFACTURER CERTIFICATE

A. When specified in individual specification sections, submit certification by manufacturer to OWNER, in quantities specified for Product Data.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, certifications, and quality control testing.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to OWNER.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULE

PART 1 GENERAL

1.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Submit initial schedule in MS Project format within 5 days after date of Agreement.

B. Revise and resubmit as required but no less than every week.

C. Submit revised schedules during weekly progress meetings.

D. Submit a computer-generated schedule with separate line for each item of Work or operation identifying first workday of each week.

E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities.

F. Indicate submittal dates and review periods required for shop drawings, product data, samples, and product delivery dates, including those furnished by OWNER, if applicable.

G. Coordinate schedule for OWNER provided equipment.

1.2 SCHEDULE REVISIONS

A. Revise schedule as necessary to reflect changes in scope of work, but no less than once per month.

B. Show changes occurring since previous submittal.
   1. Major changes in scope.
   2. Activities modified since previous submittal.
   3. Other identifiable changes.

C. Submit to OWNER.

1.3 DELAYS AND RECOVERY

A. If, at any time during Project, CONTRACTOR fails to complete an activity by its latest scheduled completion date, CONTRACTOR must submit within two working days a written statement as to how and when CONTRACTOR will reorganize work force to return to current construction schedule.

B. Whenever it becomes apparent from progress evaluation and updated schedule that milestone completion dates and/or contract completion dates will not be met, some or all of the following actions will be taken:
   1. Increase construction staffing in such quantities and crafts to substantially eliminate backlog of work.
   2. Increase number of working hours per shift, shifts per workday, work days per week, or amount of construction equipment, or combination of foregoing to substantially eliminate backlog of work.
   3. Reschedule work items to achieve concurrence of accomplishment.

C. Under no circumstances will addition of equipment or construction forces, increasing working hours or any other method, manner or procedure to return to current construction progress schedule be considered justification for contract modification or treated as acceleration.

1.4 SUBMITTAL REQUIREMENTS

A. For initial submittal of final construction schedule and subsequent revisions thereof, furnish 3 copies of schedule to OWNER. Failure to submit schedule and revisions on a timely basis as previously noted may be considered cause for withholding any progress payments otherwise due under this Contract.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Quality assurance - control of installation.

B. Tolerances.

C. References.

D. Mockup.

E. Inspecting and testing laboratory services.

F. Manufacturers' field services and reports.

1.2 RELATED SECTIONS

A. Section 01090 - References

B. Section 01300 – Submittals

C. Section 01410 - Quality Testing and Certificates

D. Section 01600 - Materials and Equipment

1.3 QUALITY CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Contractor shall be responsible for the coordination of work with required testing and inspections.

C. It is the CONTRACTOR'S responsibility to ensure that all work is inspected before it is covered up. It will be the CONTRACTOR's responsibility to uncover any work that is covered before being inspected. The CONTRACTOR shall bear all costs associated with uncovering work.

D. Comply with manufacturers' instructions, including each step in sequence, and environmental controls.

E. Should manufacturers' instructions conflict with Contract Documents, request clarification from OWNER and submit a Request for Information form before proceeding.

F. 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.

G. Perform work by persons qualified to produce workmanship of specified quality.

1.4 TOLERANCES

A. Monitor tolerance control of installed 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 Design Engineer of Record before proceeding.

C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.5 REFERENCES

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 for receiving bids, except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. Do not alter the contractual relationship, duties, and responsibilities of the parties in Contract nor those of the OWNER from the Contract Documents by mention or inference otherwise in any reference document.

1.6 INSPECTING AND TESTING LABORATORY SERVICES

A. OWNER will appoint an independent third party CQA Organization to perform inspection and testing services .

B. The CQA Organization will perform inspections, tests, and other services specified in individual specification sections as those performed by CQA Organization or OWNER.

C. Inspecting, testing, and source quality control may occur on or off the project site.

D. Reports will be submitted by the CQA Organization indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

E. Cooperate with CQA Organization; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.

F. Notify CQA Organization 24 hours prior to expected time for operations requiring services.

G. Make arrangements with OWNER and pay for additional samples and tests required for CONTRACTOR's use.

H. CQA testing or inspection does not relieve CONTRACTOR from performing quality control testing indicated in specifications.

1.7 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. When specified in individual specification sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment, and as applicable, to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

C. Submit report within 30 days of observation to OWNER for information.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01410

QUALITY TESTING AND CERTIFICATES

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Quality assurance testing performed by CQA Organization.

B. Quality control testing performed by CONTRACTOR.

C. Certificates of compliance.

1.2 RELATED SECTIONS

A. Section 01300 — Submittals

A. Section 1400 – Quality Control

1.3 SOURCE OF MATERIALS

A. CONTRACTOR must notify OWNER in writing of the sources from which it proposes to obtain material requiring approval, certification, or testing. Such notification must be made as soon as possible after award of Contract but no later than 5 days after receipt of the Notice to Proceed.

1.4 QUALITY ASSURANCE TESTING

A. Quality assurance testing is the testing of materials prior to their use in the Work and also any testing deemed necessary by OWNER for acceptance of the installed Work. CQA Organization will perform quality assurance testing of materials and workmanship in accordance with the Construction Quality Assurance Manual and reserves the right to perform additional testing at any time to determine conformance with the requirements of the Contract Documents.

B. Do not consider quality assurance testing by CQA Organization as a replacement for quality control testing conducted by CONTRACTOR, or a manufacturer producing materials for CONTRACTOR. Quality assurance testing will be at the expense of OWNER.

1.5 QUALITY CONTROL TESTING

A. Contractor shall furnish all test equipment and services.

B. Quality control testing is the testing of materials prior to their delivery from a manufacturer, or during construction, such as geomembrane cover seam testing, and such other tests specified in the various sections of the Specifications to ensure compliance with the Contract Documents. CONTRACTOR must assume full responsibility for quality control testing and give sufficient notice to OWNER and CQA Organization to permit them to witness the tests. Quality **c**ontrol testing is at the expense of CONTRACTOR and where specifically required, performed by an independent testing firm.

C. Submit the name, address, and qualifications, together with the scope of proposed services, of the proposed testing firm(s) to OWNER for approval at least 30 days prior to the scheduled commencement of any work involving such testing.

D. Within five days after completion of testing performed by or for CONTRACTOR, submit test results to OWNER. Identify test reports with the information specified for samples in Section 01300 and additionally, the name and address of the organization performing the test, and the date of the tests.

1.6 CERTIFICATES OF COMPLIANCE

A. Where specifically indicated, CONTRACTOR may use certificates of compliance for certain materials and products in lieu of the specified sampling and testing procedures. Submit certificates required for demonstrating proof of material compliance with specification requirements. Submit in duplicate with each lot of material delivered to the Work or prior to delivery as required by the Contract. The lots so certified must be clearly identified by the certificate. Certificates must be signed by an authorized representative of the producer or manufacturer and state that the material complies in all respects with the requirements of the Contract Documents. In the case of multiple shipments, each shipment must be accompanied or preceded by a Certificate of Compliance.

B. The Certificate of Compliance must be accompanied by a certified copy of test results or state that such test results are on file with the producer or manufacturer and must be furnished to OWNER on request. The certificate must give the information specified for samples in Section 01300, the name and address of the organization performing the tests, the date of the tests, and the quantity of material shipped.

C. Materials used on the basis of a Certificate of Compliance may be sampled and tested at any time. The fact that material is used on the basis of a Certificate of Compliance does not relieve CONTRACTOR of responsibility for incorporating material in the Work which conform to the requirements of the Contract and any such material not conforming to such requirements will be subject to rejection, whether in place or not.

D. OWNER reserves the right to refuse to permit the use of certain materials on the basis of a Certificate of Compliance.

1.7 REPAIR COSTS

A. All costs to repair or replace non-conforming materials or installation are the responsibility of the CONTRACTOR.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Construction facilities required for the construction of the permanent facilities specified under the Scope of Work of this Contract.

B. Construction facilities include furnishing of all equipment, materials, tools, accessories, incidentals, labor, and performing all work for the installation of equipment and for construction of facilities, including their maintenance, operation, and removal, if required, at the completion of the Work under the Contract.

1.2 RELATED SECTIONS

A. Section 01560 - Temporary Controls

1.3 TEMORARY FACILITY TYPES

A. Construction facilities include, but are not limited to, the following temporary offices, utilities, equipment, materials, facilities, areas, and services:
   1. Field Office
   2. Parking Areas
   3. Temporary Roads
   4. Storage of Materials and Equipment
   5. Construction Equipment
   6. Temporary Sanitary Facilities
   7. Temporary Electric Power
   8. Temporary Water
   9. Temporary Heat
   10. First Aid Facilities
   11. Security

B. Waste Disposal

1.4 REFERENCES

A. Construct/install, maintain and operate construction facilities in accordance with the applicable federal, state, and local laws, rules, and regulations.

1.5 GENERAL REQUIREMENTS

A. CONTRACTOR is responsible for furnishing, installing, constructing, operating, maintaining, removing and disposing of the construction related facilities, as specified in this Specification, and as required by OWNER for the completion of the Work under the Contract.

B. Locate and maintain construction facilities in a clean, safe and sanitary condition at all times until completion of the Contract.

C. The requirements specified herein are in addition to any requirements specified elsewhere in the Contract Documents.

D. Minimize land disturbances related to the construction facilities to the greatest extent possible and restore land to the extent reasonable and practical, to its original contours by grading to provide positive drainage and by seeding the area to match with existing vegetation or as specified elsewhere.

E. Design and construct utilities to provide uninterrupted service.

1.6 FIELD OFFICE

A. If deemed necessary, the CONTRACTOR must provide an office for his own staff.

B. The location of the office must be as approved by OWNER.

C. At a minimum provide telephone and fax capabilities for communication.

1.7 TEMPORARY ROADS

A. General.
   1. Temporary roads are existing roads that are improved, or new roads constructed by CONTRACTOR for convenience of CONTRACTOR in the performance of the Work under the Contract.
   2. Coordinate construction with OWNER.
   3. If applicable, coordinate all road construction activities with local utilities, fire and police departments.
   4. Keep erosion to a minimum and maintain suitable grade and radii of curves to facilitate ease of movement of vehicles and equipment.
   5. Furnish and install longitudinal and cross drainage facilities including, but not limited to, the ditches, structures, pipes and the like.

B. Clean equipment so that mud or dirt is not carried onto public roads. Clean up any mud or dirt transported by its equipment on paved roads both on-site and off-site.

1.8 STORAGE OF MATERIALS AND EQUIPMENT

A. Make arrangements for material and equipment storage areas. Locations and configurations of such facilities are subject to the acceptance of OWNER.

B. Confine all operations, including storage of materials, to approved areas. CONTRACTOR is liable for any and all damage caused during such use of property of the OWNER or others. Store materials in accordance with manufacturer's instructions when applicable.

C. Store construction materials and equipment within boundaries of designated areas. Storage of gasoline or similar fuels must conform to state and local regulations and be limited to the areas approved for this purpose by the OWNER.

1.9 CONSTRUCTION EQUIPMENT

A. Erect, equip, and maintain all construction equipment in accordance with all applicable statutes, laws, ordinances, rules, and regulations of OWNER or other authority having jurisdiction.

B. Provide, maintain, and remove upon completion of the Work, all temporary rigging, scaffolding, hoisting equipment, debris boxes, barricades around openings and excavations, fences, ladders, and all other temporary work, as required for all work hereunder unless otherwise directed by OWNER.

C. Construction equipment and temporary work must conform to all the requirements of state, county, and local authorities, OSHA, and underwriters that pertain to operation, safety, and fire hazard. Furnish and install all items necessary for conformity with such requirements, whether or not called for under separate sections of these Specifications.

1.10 TEMPORARY SANITARY FACILITIES

A. Provide temporary sanitary facilities for use by all employees and persons engaged in the work, including subcontractors, their employees and authorized visitors.

B. Sanitary facilities include enclosed chemical toilets and washing facilities. These facilities must meet the requirements of local public health standards. Open pit or trench latrines are not permitted.

C. Locate sanitary facilities as approved by OWNER, and maintain in a sanitary condition during the entire course of the work.

1.11 TEMPORARY ELECTRIC POWER

A. Provide and maintain during the course and progress of the Work all electrical power and wiring requirements to facilitate the work of all trades and services associated with the work. Make arrangements with the applicable serving utility company or provide generators and pay all charges for providing and maintaining electrical service including permits and usage costs at the site unless otherwise approved by the OWNER. Furnish all temporary wiring, feeders, and connections.

B. Routing of temporary conductors, including welding leads must not create a safety hazard nor interfere with operation and maintenance of existing facilities. GFCI receptacles to be used where appropriate.

C. Install all temporary wiring in accordance with the applicable requirements of the local electrical code.

1.12 TEMPORARY WATER

A. Limited water is available on-site for construction.

B. Make all arrangements for water needs from an off-site supplier.

1.13 FIRST AID FACILITIES

A. Provide first aid equipment and supplies to serve all CONTRACTOR personnel at the site.

1.14 SECURITY

A. Make all necessary provisions and be responsible for the security of the Work and the site until final inspection and acceptance of the Work unless otherwise approved by the OWNER. Contractor is responsible for the security of all equipment and material on site.

1.15 SHUT-DOWN TIME OF SERVICE

A. Do not disconnect or shut down any part of the existing utilities and services, except by express permission of OWNER.

1.16 MAINTENANCE

A. Maintain all construction facilities, utilities, temporary roads, services to office, and the like in good working condition as required by OWNER during the term of the Contract.

B. Dispose of all waste and debris to maintain facilities in a safe and sanitary condition.

1.17 STATUS AT COMPLETION

A. Upon completion of the Work, or prior thereto, when so required by OWNER:
   1. Repair damage to roads caused by or resulting from the CONTRACTOR's work.
   2. Remove and dispose of all construction facilities including office trailers, and other facilities and utilities including all concrete foundations. Similarly, all areas utilized for temporary facilities shall be returned to near original, natural state, or as otherwise indicated or directed.
   3. Obliterate temporary roads built for CONTRACTOR's convenience and restore the area to near original conditions to the extent practicable unless otherwise approved by the OWNER.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01505

MOBILIZATION/DEMOBILIZATION

PART 1 GENERAL

1.1 DESCRIPTION

A. Mobilization consists of work described in Division 1 of the technical specifications not specifically paid for under other bid items, and preparatory work and operations, including but not limited to those necessary for the movement of personnel, project safety, including adequate personnel, equipment, supplies, and incidentals to the project site; for the establishment of offices, buildings and other facilities necessary for work on the project; for premiums on bond and insurance for the project and for other work and operations the CONTRACTOR must perform or costs the CONTRACTOR must incur before beginning work on the project, which are not covered in other bid items. Demobilization consists of work and operations included but not limited to, those necessary for movement of personnel, equipment, supplies, incidentals, and offices off-site, disconnection of temporary utilities, and cleaning/restoring the site.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01510

MAINTENANCE OF EXISTING FACILITIES DURING CONSTRUCTION

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. General.

B. Cooperation with Other Contractors.

C. Coordination of Work.

D. Payment.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control

B. Section 01700 - Contract Closeout

1.3 GENERAL

A. Locate and mark existing utilities. Contractor shall not abandon any utilities without the permission of the Owner.

B. Repair any utilities damaged, without the permission of the Owner, as a result of his Work at no cost to the Owner.

C. Remove, relocate, or adjust such existing facilities that are to remain, as may be necessary for the performance of the work, and rebuild any such disturbed existing facilities in as good as new condition as found.

D. Make all necessary or required revisions and perform all construction required by operations under the contract, incident to any interference with power transmission and distribution, telephone, cable, and other utility lines or with the maintenance of traffic or service thereon, all in a manner satisfactory to the owners and operators thereof.

E. Any utilities found that were not previously known or identified should be located and marked on record drawings.

F. Protect the existing groundwater extraction and treatment facilities to enable the Owner to continue to operate the equipment during the construction of the vault.

1.4 COOPERATION WITH OTHER CONTRACTORS

A. The Owner and others will be working within the project area while the work is in progress – for example in conjunction with use of existing treatment equipment.

B. Schedule her/his work in conjunction with these other organizations to minimize mutual interference.

1.5 COORDINATION OF WORK

A. Maintain overall coordination for the execution of the work.

B. Based on the progress schedule prepared in accordance with these Special Provisions, obtain from each subcontractor a schedule and shall be responsible for all parties maintaining these schedules or for coordinating required modifications.

1.6 PAYMENT

C. No separate or additional payment will be made for maintenance of existing facilities during construction and contractor coordination, but shall be considered incidental to the work and shall be included in the various unit or lump sum bid items.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01560

TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary controls required during the term of the Contract for the protection of the environment and the health and safety of workers and general public.

B. Furnishing all equipment, materials, tools, accessories, incidentals, and labor, and performing all work for the installation of equipment and construction of facilities, including their maintenance and operation during the term of the Contract.

C. Dust Control

D. Pollution Control

E. Traffic and Safety Controls

F. Temporary Erosion and Sediment Control

1.2 RELATED SECTIONS

A. Section 01500 - Construction Facilities

1.3 DUST CONTROL

A. Provide dust control measures at the request of OWNER and to meet requirements of various specifications.

B. Dust control consists of transporting water, furnishing required equipment, additives, accessories and incidentals, and carrying out proper and efficient measures wherever and as often as necessary to reduce dust nuisance, and to prevent dust originating from construction operations throughout the duration of the Contract, as required by OWNER, including maintaining 200th Street in a clean condition.

C. Apply water by means of pressure-type distributors or pipelines equipped with a spray system or hoses with nozzles that will insure a uniform application of water.

D. Equip all equipment used for the application of water with a positive means of shut-off.

E. Unless otherwise permitted by OWNER or unless all the water is applied by means of pipelines, provide at least one mobile unit with a minimum capacity of 3,500 gallons at the site in operating condition for applying water at the site during construction.

1.4 POLLUTION CONTROL

A. Erosion Control: Control sediment transport on sloped surfaces using best management practices (BMPs) and in accordance with the Erosion and Sediment Control Plan as shown on the Construction Drawings.

B. Pollution of Waterways: Perform work using methods that prevent entrance or accidental spillage of solid or liquid matter, contaminants, debris and other objectionable pollutants and wastes into streams, watercourses, flowing or dry, and underground water sources. Such pollutants and wastes will include, but will not be restricted to refuse, earth and earth products, garbage, cement, concrete, sewage effluent, industrial waste, radioactive substances, hazardous chemicals, oil and other petroleum products, aggregate processing tailings, and mineral salts. Dispose of pollutants and wastes in accordance with applicable permit provisions or in a manner acceptable to and approved by the OWNER.

C. Storage and Disposal of Petroleum Products:
   1. Petroleum products covered by this section include gasoline, diesel fuel, lubricants, heating oils, and refined and used oil. During project construction, store all petroleum products in such a way as to prevent contamination of all ground and surface waters.
   2. Lubricating oil may be brought into the project area in steel drums or other means, as CONTRACTOR elects. Store used lubricating oil in steel drums, or other approved means, and return them to the supplier for disposal. Do not burn or otherwise dispose of at the project area.
   3. If the total volume of stored petroleum products is greater than 1,320 gallons and these products are stored above ground, prepare a spill prevention control and countermeasure plan in accordance with applicable EPA and other state regulations. Submit plan to OWNER.

1.5 TRAFFIC AND SAFETY CONTROLS

A. Post construction areas and roads with traffic control signs or devices used for protection of workmen, the public and equipment. The signs or devices must conform to the American National Standards Institute, Manual on Uniform Traffic Control Devices for Streets and Highways.

B. Remove signs or traffic control devices as soon as they have served their purpose. It is particularly important to remove any markings on road surfaces that under conditions of poor visibility could cause a driver to turn off the road or into traffic moving in the opposite direction.

C. Barricades for protection of employees must conform to the portions of the American National Standards Institute, Manual on Uniform Traffic Control Devices for Streets and Highways, relating to barricades.

D. Hauling Materials on Public Roads: Follow all requirements stated in the permits for using public roads for hauling materials to the site.

E. Provide flag persons, properly equipped with International Orange protective clothing and flags, as necessary, to direct or divert pedestrian or vehicular traffic.

F. Construct and maintain fences, planking, barricades, lights, shoring, and warning signs as required by local authorities and federal and state safety ordinances, and as required, to protect OWNER's property from injury or loss and as necessary for the protection of the public, and provide walks around any obstructions made in a public place for carrying on the Work covered in this Contract. Leave all such protection in place and maintained until removal is authorized.

G. Guard and protect all workers, pedestrians, and the public from excavations, blasting operations, construction equipment, all obstructions, and other dangerous items or areas by means of adequate railings, guard rails, temporary walks, barricades, warning signs, sirens, directional signs, overhead protection, planking, decking, danger lights, etc.

1.6 TEMPORARY EROSION AND SEDIMENT CONTROL

A. Comply with erosion and sediment controls outlined on the Construction Drawings.

1.7 MAINTENANCE

A. Maintain all temporary controls in good working conditions during the term of the Contract for the safe and efficient transport of equipment and supplies, and for construction of permanent works, as required by OWNER.

1.8 STATUS AT COMPLETION

A. Upon completion of the Work, or prior thereto, when so required by OWNER, remove all temporary controls and restore disturbed areas as required by OWNER.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. General requirements for material and equipment including handling, transportation, and storage thereof.

1.2 RELATED SECTIONS:

A. General Conditions.

B. Section 01300 - Submittals

1.3 QUALITY OF MATERIALS

A. Provide materials and equipment that are new, except as may be indicated in the Specifications or on the Construction Drawings.

B. Materials and equipment must be manufactured, handled, transported, stored, and used in accordance with the requirements of the manufacturer and to ensure completed work meets the requirements of the Contract Documents.

1.4 HANDLING AND TRANSPORTATION

A. Handling:
   1. Avoid bending, scraping, or overstressing materials and equipment. Protect projecting parts by blocking with wood, by providing bracing, or by other approved methods.
   2. Protect materials and equipment from soiling and moisture by wrapping or by other approved means.
   3. Protect small parts of equipment and accessories in containers such as boxes, crates, or barrels to avoid dispersal and loss. Firmly secure an itemized list and description of contents to each such container.

B. Transportation: Load, transport, unload, and store all materials and equipment such that they are kept clean and free from damage.

1.5 STORAGE AND PROTECTION

A. Provide sheltered, weather-tight, or heated weather-tight storage as required for materials and equipment subject to weather damage.

B. Provide blocking, platforms, or skids for materials and equipment subject to damage by contact with ground.

C. Store packaged materials in their original unbroken package or container.

D. Protect materials and equipment from damage during warehousing operations.

E. Owner shall not be held responsible for loss, theft, or damage to equipment or materials at the site.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01630

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 GENERAL

1.1 SUMMARY

A. This Section describes product options available to BIDDERS and the CONTRACTOR, plus procedures for securing approval of proposed substitutions.

B. Related work:
   1. Make submittals in accordance with pertinent provisions of Section 01300.

1.2 PRODUCT OPTIONS

A. The Contract is based on standards of quality established in the Contract Documents.
   1. In agreeing to the terms and conditions of the Contract, the CONTRACTOR has accepted a responsibility to verify that the specified products will be available and to place orders for all required materials in such a timely manner as is needed to meet his agreed construction schedule.
   2. Neither the OWNER nor the Design Engineer of Record has agreed to the substitution of materials or methods called for in the Contract Documents, except as they may specifically otherwise state in writing.

B. Materials and/or methods specified by name:
   1. Where materials and/or methods are specified by naming one single manufacturer and/or model number, without stating that equal products will be considered, only the material and/or method named is approved for incorporation into the Work.
   2. Should the CONTRACTOR demonstrate to the approval of the OWNER that a specified material or method was ordered in a timely manner and will not be available in time for incorporation into this Work, the CONTRACTOR must submit to the OWNER such data on proposed substitute materials and/or methods as are needed to help the OWNER determine suitability of the proposed substitution.

C. Where materials and/or methods are specified by name and/or model number, followed by the words "or an equal approved in advance by the OWNER" or similar wording:
   1. The material and/or method specified by name establishes the required standard of quality;
   2. Materials and/or methods proposed by the CONTRACTOR to be used in lieu of materials and/or methods so specified by name must in all ways equal or exceed the qualities of the named materials and/or methods;
   3. Proposed substitutions must be described in the CONTRACTOR's General Contract bid.

D. The following products do not require further approval except for interface within the Work:
   1. Products specified by reference to standard specifications such as ASTM and similar standards;
   2. Products specified by manufacturer's name and catalog model number.

E. Where the phrase "or equal," or "or equal as approved by the OWNER," occurs in the Contract Documents, do not assume that the materials, equipment, or methods will be accepted as equal unless the item has been specifically so approved in writing for this Work by the OWNER.

F. The decision of the OWNER is final.

1.3 DELAYS

A. Delays in construction arising by virtue of the non-availability of a specified material and/or method will not be considered by the OWNER as justifying an extension of the agreed Time of Completion.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Closeout procedures.

B. Substantial Completion.

C. Final cleaning.

D. Final Inspection.

E. Re-inspection Costs.

F. Closeout Submittals.

G. Release of Liens or Claims.

H. Final Acceptance.

I. Final Adjustment of Accounts.

J. Project record documents.

K. Payment.

L. Post-Construction Inspection.

1.2 RELATED SECTIONS

A. Section 01300 - Submittals

B. Section 01500 - Construction Facilities

1.3 CLOSEOUT PROCEDURES

A. It is the intent of these Contract Documents that the Contractor deliver a complete and useable facility capable of performing its intended functions and ready for use.

B. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for OWNER's inspection.

C. The Engineer will make an inspection after receipt of Contractor's certification.

D. Submit a list of items to be completed or corrected.

E. Provide submittals to OWNER that are required by governing or other authorities.

F. Submit final Application for Payment identifying total adjusted contract sum, previous payments, and sum remaining due. Use format described in Section 01027.

G. OWNER will occupy all portions of the facility.

1.4 SUBSTANTIAL COMPLETION

A. If it appears to the OWNER's Representative that work is substantially complete:
   1. The OWNER's Representative may request and the Contractor shall prepare and submit to the Engineer, a list of items to be completed or corrected as determined by the inspection.
   2. If the OWNER's Representative then considers the work to be substantially complete, the OWNER's Representative will issue a Certification of Substantial Completion, with appropriate conditions, accompanied by a list of the items to be completed and corrected, as verified and amended by the OWNER's Representative. Omission of any item from the list shall not relieve the Contractor from responsibility to complete all the work in accordance with the Contract.
   3. The Owner may commence with occupancy of the Project or designated portion of the project.
   4. The Contractor shall complete all the work within the time designated in the Certificate, or if not so designated within a reasonable time.

B. Should the OWNER's Representative consider that work is not substantially complete:
   1. The Engineer shall notify the Contractor stating the reasons in writing.
   2. The Contractor shall complete work and send second written notice to the Engineer certifying that Project or designated portion of Project is substantially complete.

1.5 FINAL CLEANING

A. Execute final cleaning prior to final inspection.

B. Remove waste and surplus materials, rubbish, and construction facilities from the construction site. Dispose of materials in locations to be directed by the Engineer.

C. Ditches, washes, or drainage ways shall not be filled if this action may create water control problems. Disposal operations shall not create unsightly or unsanitary nuisances.

D. The Contractor shall touch-up or repair finished surfaces on structures, equipment, fixtures, or installations that have been damaged prior to final acceptance.

1.6 FINAL INSPECTION

A. The Contractor shall submit written certification that:
   1. Work has been completed in accordance with Contract Documents.
   2. Equipment and systems have been tested in presence of the Engineer and are operational.
   3. The project is completed, and ready for final inspection.

B. The OWNER's Representative will make a final inspection within a reasonable time after receipt of certification.

C. Should the OWNER's Representative consider that work is complete in accordance with requirements of Contract Documents, the Engineer shall request the Contractor to make project closeout submittals.

D. Should the OWNER's Representative consider that work is not complete:
   1. Engineer shall notify the Contractor in writing stating the reasons.
   2. The Contractor shall take immediate steps to remedy the stated deficiencies and upon completion send a second written notice to the Engineer certifying that work is complete.
   3. The Engineer will re-inspect work.

1.7 RE-INSPECTION COSTS

A. If the OWNER's Representative is required to perform second inspections because of inaccuracies in original certifications of the Contractor, the Owner will charge the Contractor for the resulting costs incurred by the Owner including Engineering fees.

1.8 CLOSEOUT SUBMITTALS

A. Project Record Documents.

B. Guarantees, Bonds, and Letters of Credit required by these Specifications.

C. Easement Release(s) if applicable.

D. Certificates of disposal for any hazardous substances that were removed during construction.

E. At the close of the Contract the Contractor shall:
   1. Pay all utility bills.
   2. Remove all electrical, telephone, water, offices, and any other temporary service equipment that may remain.

1.9 RELEASE OF LIENS OR CLAIMS

A. Final acceptance will not be given until satisfactory evidence of payments to all subcontractors, release of liens has been submitted to the OWNER's Representative, including evidence that all state taxes and labor and industry fees, and utilities have been paid.

1.10 FINAL ACCEPTANCE

A. The Engineer will provide the Owner with a Recommendation of Final Acceptance following satisfactory completion of the final punch list items and all the items listed above. The Owner will then provide the Contractor with Final Acceptance which will begin the 2-year correction period as established in the Project Manual. Date of Final Acceptance from the Owner sets the completion date of the Contract.

1.11 FINAL ADJUSTMENT OF ACCOUNTS

A. Submit final statement of accounting to the Engineer.

B. Statement shall reflect all uncompleted adjustments:
   1. Additions and deductions resulting from:
      a. Previous Change Orders
      b. Cash allowances
      c. Unit prices
      d. Other adjustments
      e. Deductions for uncorrected work
      f. Penalties and bonuses
      g. Deductions for liquidated damages
   2. Unadjusted sum remaining due.

1.12 PROJECT RECORD DOCUMENTS

A. Maintain on site, one set of the following record documents; record actual revisions to the work.
   1. Construction Drawings.

2. Specifications.
3. Addenda.
4. Change Orders and other Modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.
6. Copies of all equipment and material warranties.

B. Ensure entries are complete and accurate, enabling future reference by OWNER.

C. Store Record Documents separate from documents used for construction. Final version of record drawings prepared for the OWNER in hard copy and AutoCad.

D. Record information concurrent with construction progress.

E. Record documents shall be available for inspection by the OWNER at any time.

F. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name, product model, and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and Modifications.

G. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured horizontal and vertical location of items listed in Article 1.4 of Section 01052.
2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
3. Field changes of dimension and detail.
4. Details not indicated on original Construction Drawings.

H. Submit documents to OWNER with claim for final Application for Payment.

I. Final payment will not be made by owner until record documents are submitted and approved,

1.13 POST-CONSTRUCTION INSPECTION

A. Prior to expiration of one year from date of final acceptance, the Engineer may make visual inspection of the Project in company with the Contractor to determine whether correction of work is required, in accordance with provisions of the General Conditions.

B. For warranties beyond one year, the Owner will make inspections after notification to the Contractor.

C. The Owner will promptly notify the Contractor, in writing, of any observed deficiencies.

1.14 PAYMENT

A. Fulfill conditions laid out above.

B. Work performed under this Section shall be considered incidental to the construction bid items, and no separate or additional payment will be made.

C. Should final completion be materially delayed through no fault of the Contractor, the Owner may issue a Final Certificate for Payment, in accordance with the Specifications and existing laws.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

DIVISION 2

SITE WORK

SECTION 02221

EXCAVATING

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Preparation for excavation.

B. Excavation of area in which reactor vault will be installed.

C. Excavation for preparation of area to stockpile soils.

1.2 RELATED SECTIONS

A. Section 01025 – Measurement and Payment

B. Section 01052 – Layout of Work and Surveys

1.3 FIELD MEASUREMENTS

A. Verify construction staking for the work is as designed.

1.4 REFERENCES

A. Section 01052 – Layout of Work and Surveys.

B. Subsurface information provided with the Invitation to Bid documents.

1.5 SUBMITTALS FOR REVIEW

A. Submit the following for Owner review and approval before initiating any excavation activities:
   1. Documentation demonstrating location has been checked for underground utilities, and if present utilities are clearly marked.
   2. Proposed excavation equipment.
   3. Proposed Excavation, Shoring, Water Management and Tremie Concrete Placement Plan
   4. Documentation that the groundwater elevation has been managed appropriately the reactor vault excavation area to enable the excavation and construction of the reactor vault tremie slab to be performed without causing instability at the base of the excavation or around the excavation.

PART 2 PRODUCTS

2.1 MATERIALS REQUIRING EXCAVATION

A. Materials requiring excavation may include asphalt, concrete, gravel, and native soils.

PART 3 EXECUTION

3.1 PREPARATION

A. Perform all excavation of every description, regardless of the type, nature, or condition of material encountered within the limits of the project to the lines and grades indicated on the Construction Drawings.

B. Perform construction staking to identify required excavation lines, grades and slopes and to provide construction control points.

C. Locate, identify, and protect utilities from damage.

D. Notify utility company to locate utilities, if applicable.

E. Provide for dust control.

F. Perform clearing and grubbing of vegetation within the construction area to completely remove all vegetation including roots.

G. Remove miscellaneous site features such as internal fencing, curbs, concrete pads, and any other surface features required to be removed to facilitate grading and installation of final cover.

H. Protect benchmarks, existing structures and fences from construction activities, excavation equipment and vehicular traffic.

I. During the process of excavation, the Contractor shall maintain the grade in such condition that it will be drained at all times. Install temporary drains and drainage ditches to intercept or direct surface-water which may affect the promotion or condition of the work.

J. Maintain a method to collect water that drains from excavated soils and shall treat collected water with water collected as part of the excavation water management activities.

K. Conform to all OSHA regulations for excavations.

3.2 FIELD EXCAVATION FOR REACTOR VAULT

A. Provide all labor, materials and equipment to excavate soils to limits indicated on construction drawings. Include shoring, managing water, handling soils, and treating water as required to excavate soils, construct mass concrete slab below vault by tremie method, and maintain excavation during the construction of the reactor vault.

B. To reduce the risk for base heave, complete the remaining excavation while maintaining the water level within 6 feet of the surrounding ground surface until the mass concrete slab below the reactor vault has been constructed.

C. Stockpile excavated soils on site in designated area. Construct soil stockpiles consistent with the Erosion and Sediment Control Drawing and City of Kent erosion and sediment control requirements.

D. Manage water emanating from the soil stockpile, in accordance with the Excavation, Shoring, Water Management and Tremie Concrete Placement Plan.

E. Abide by provisions of the erosion and sediment control plan, including covering stockpiled soils at the end of each day. The final stockpile shall be curbed or graded to prevent runon from impacting the stockpile and securely covered to prevent erosion and contaminated stormwater runoff and incidental contact by trespassers.

F. Collect and treat construction water as necessary, and discharge to the King County Sanitary Sewer system consistent with the requirements of an approved King County Industrial Waste Program Construction Dewatering Request (prepared by Owner). Treatment required to meet discharge limitations may include removal of sediments and other settleable solids through settling and/or filtration. Discharge of treated dewatering wastewater into the sanitary sewer will be through existing connection to the sewer currently operated by the Owner. Coordinate the connection requirements and location with Owner.

G. Document that the base of the excavation is stable and not subject to base heave.

3.4 EXCAVATION TOLERANCES

A. Line: plus or minus 1.0 feet.

B. Grade for base of excavation: plus or minus 0.5 feet.

3.5 FIELD QUALITY CONTROL

A. Comply with Sections 01400 and 01410.

B. Provide for visual inspection of bearing surfaces.

END OF SECTION

SECTION 02225

DRAINAGE GRAVEL

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Furnishing, loading, hauling and placing drainage gravel material to surround the treatment ZVI Reactor Vault.

1.2 RELATED SECTIONS

A. Section 01025 – Measurement and Payment.

B. Section 01300 – Submittals.

C. Section 02711 - Polyethylene Pipe.

D. Section 02771 – Geotextiles.

1.3 REFERENCES

A. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head).

1.4 DEFINITIONS

A. Construction Quality Assurance Consultant (CQAC): The party, independent from the manufacturer or installer, responsible for observing and documenting activities related to quality assurance of the project. Also responsible for issuing a construction monitoring report and certification sealed by a Washington State Registered Professional Engineer.

B. Construction Quality Assurance Monitor (CQA Monitor): The CQA site representative, who also represents the OWNER and is responsible for on site implementation of CQA procedures defined by the CQA Manual.

1.5 SUBMITTALS FOR REVIEW AND TESTING

A. No less than 21 days prior to scheduled installation, submit one 40-pound sample of the proposed drainage gravel to the CQAC for gradation and hydraulic conductivity testing.

PART 2 PRODUCTS

2.1 REACTOR VAULT DRAINAGE GRAVEL

A. Non-hazardous and free of organic or other deleterious material.

B. Having a hydraulic conductivity of greater than or equal to 0.5 cm/sec when placed in accordance with this Section.

C. Material greater than ½ inch in largest dimension must be rounded to sub-rounded.

D. Meeting the following gradation.

U.S. Sieve Size	Percent Passing
2-inch	100
1½-inch	85-100
1-inch	50-85
¾-inch	0-10
3/8-inch	0-5
#4	0-3
#40	0-3
#200	0-2

E. Gradation requirements are an index test. Gradation of materials below the 2-inch dimension and above the ½-inch sieve can be modified if the hydraulic conductivity requirements are met. Material must be of a gradation such that the D_{85} size is greater than ½-inch.

PART 3 EXECUTION

3.1 PLACEMENT OF REACTOR VAULT DRAINAGE GRAVEL

A. Place only when geotextile separator and vault installations, are complete in accordance with Specifications.

B. Place piping external to the reactor vault at the appropriate elevation within the gravel.

C. Place to lines, grades and thickness indicated on the Drawings.

D. Place without damaging geotextile, piping, or reactor vault. If damaged, repair.

3.2 FIELD QUALITY CONTROL

A. Prior to beginning material placement, demonstrate to Owner that drainage gravel placement techniques will not damage the geotextile, piping, or vault materials, and that temporary construction excavation shoring can be removed during, or after placement of the gravel without affecting any of the constructed materials.

B. Verify the drainage gravel reaches the top of reactor vault as shown on the construction drawings with no large voids.

C. Grading tolerance for drainage gravel:
   1. Line: plus or minus 1.0 feet.
   2. Grade: plus 0.1 feet to minus 0.3 feet.

3.3 FIELD QUALITY ASSURANCE

A. The CQA Monitor will determine gradation of material before and after placement in accordance with ASTM C136.

B. The CQA Monitor will determine hydraulic conductivity of submitted material prior to CONTRACTOR's delivery in accordance with ASTM D2434.

END OF SECTION

SECTION 02711

POLYETHYLENE PIPE

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Furnishing and installing perforated and solid wall polyethylene pipe in locations indicated on the Construction Drawings to construct collection piping outside and inside the ZVI Reactor Vault.

1.2 RELATED SECTIONS

A. Section 01025 – Measurement and Payment

B. Section 01300 – Submittals

C. Section 02225 – Drainage Gravel

1.3 REFERENCES

A. ASTM D638 – Standard Test Method for Tensile Properties of Plastics.

B. ASTM D696 – Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between –30 degrees C and 30 Degrees C With a Vitreous Silica Dilatometer.

C. ASTM D748 - Standard Specification for Natural Block Mica and Mica Films Suitable for Use in Fixed Mica-Dielectric Capacitors.

D. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

E. ASTM D1238 - Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer.

F. ASTM D1248 - Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable.

G. ASTM D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique.

H. ASTM D1525 - Standard Test Method for Vicat Softening Temperature of Plastics.

I. ASTM D1603 - Standard Test Method for Carbon Black In Olefin Plastics.

J. ASTM D1693 - Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics.

K. ASTM D2240 - Standard Test Method for Rubber Property—Durometer Hardness.

L. ASTM D2513 – Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing and Fittings.

M. ASTM D2657 - Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings.

N. ASTM D2837 - Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.

O. ASTM D3035 - Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.

P. ASTM D3261 - Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

Q. ASTM D3350 — Specification for Polyethylene Plastics Pipe and Fitting Materials.

1.4 DEFINITIONS

A. Standard Dimensional Ratio (SDR) is defined as the actual outside pipe diameter divided by the wall thickness.

B. Construction Quality Assurance Consultant (CQAC): The party, independent from the manufacturer or installer, responsible for observing and documenting activities related to the quality assurance of the production and installation of the geosynthetic components of the geotextile. Also responsible for issuing a construction monitoring report and certification sealed by a Registered Professional Engineer.

C. Construction Quality Assurance Monitor (CQA Monitor): The CQAC site representative, who also represents the OWNER and is responsible for on site implementation of CQA procedures defined by the CQA Manual.

1.5 SUBMITTALS

A. Prior to fusion welding submit a list of those individuals certified for polyethylene pipe fusion welding with copies of their current certificates.

B. Submit pipe and fittings product data and manufacturer's quality control data-demonstrating material complies with Part 2 of this Section. Submit 10 days prior to shipment.

C. Submit welding system proposed for this project. Submit 10 days prior to welding.

1.6 DELIVERY, STORAGE AND HANDLING

A. Exercise care during loading, transit, and unloading to prevent damage by abrasion and puncturing.

B. Store HDPE pipe with support to prevent developing a permanent set.

C. Stack the heaviest series of HDPE pipe on the bottom.

D. Stack HDPE pipe no more than eight layers high or consistent with the Manufacturer's recommendations.

E. Document HDPE pipe damaged during transportation, loading, unloading, delivery or storage. Provide documentation to OWNER.

F. Repair or replace HDPE pipe damaged during delivery, storage or handling.

PART 2 PRODUCTS

2.1 PIPE AND FITTINGS

A. All pipe sizes indicated on the Construction Drawings and specified in this Section reference nominal diameter, unless otherwise indicated on the Construction Drawings or in this Section.

B. Provide pipe with SDR as indicated on the Construction Drawings.

C. Provide pipe conforming to the requirements of ASTM D3261 and ASTM D3035 and the following:

Property	Test Procedures	Unit	Required Values
1. Material Designation	Plastic Pipe Inst TR-4	—	PE 3608
2. Manufacturing Standard	ASTM 2513		
3. Cell Classification	ASTM D3350	—	345464C
Pipe Properties			
4. Density	ASTM D1505	gm/cm^3	0.955 (black)
5. Melt Index	ASTM D1238	gm/10 min.	0.08
6. Hydrostatic Design Basis 73°F (23°C)	ASTM D2837	psi	1,600
7. Hydrostatic Design Basis 140°F (60°C)	ASTM D2837	psi	800
8. UV Stabilizer (carbon black content)	ASTM D3350	%	Min 2%
Material Properties			
9. Flexural Modulus	ASTM D790	psi	min. 110,000
10. Tensile Strength at Yield	ASTM D638 Type IV	psi	3,200
11. Elongation at Break 2 in/min., Type IV bar	ASTM D638	%	>700
12. Elastic Modulus	ASTM D638	psi	>150,000
13. Hardness	ASTM D2240	Shore D	62
14. PENT	ASTM F1473	Hrs.	>100
Thermal Properties			
15. Vicat Softening Temperature	ASTM D1525	Fahrenheit	256
16. Brittleness Temperature	ASTM D746	Fahrenheit	-103
17. Thermal Expansion	ASTM D696	in/in/Fahrenheit	1.0×10^{-4}

D. Containing no recycled compound except that generated in the manufacturer's own plant and from resin of the same specification as the raw material supplier.

E. Resin for pipe and fittings listed by both N.S.F. and P.P.I. and manufactured in accordance with ASTM D3035/F714-81.

F. Homogeneous throughout and free of visible cracks, holes, foreign inclusions, or other injurious defects. Being uniform in color, capacity, density, and other physical properties.

G. Provide the following information continuously marked on the pipe or spaced at intervals not exceeding 5 feet.
   1. Name and/or trademark of the pipe manufacturer.
   2. Nominal pipe size.
   3. Standard Dimensional Ratio (SDR).
   4. PE 3608.
   5. Manufacturers Standard Reference.
   6. A production code from which the date and place of manufacturer can be determined.

2.2 PIPE COUPLINGS AND FITTINGS

A. Provide HDPE blind flange adapters, molded stub ends, and molded end caps and other fittings in accordance with the Construction Drawings and manufactured from the same resin as the pipe.

2.3 FABRICATED FITTINGS

A. Provide fabricated or molded fittings as indicated on the Construction Drawings.

2.4 PIPE PERFORATION

A. Perforation diameter: 3/8 inch for 4-inch diameter pipe.

B. Number of perforations: 4 rows, 90 degrees apart on pipe circumference, spaced 6 inches center to center, and 4 rows, 90 degrees apart, staggered, and spaced 3 inches from previous rows center to center.

PART 3 EXECUTION

3.1 QUALITY CONTROL

A. Use adequate numbers of skilled workman who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

3.2 PLACING AND LAYING PIPE

A. Follow the manufacturer's recommendations when hauling, unloading, and stringing the pipe.

B. Do not push or pull pipe and fittings over sharp projections, or drop, or have objects dropped on it.

C. Inspect for defects before installation.

D. Remove any pipe showing kinks, buckles, cuts, gouges, or any other damage that, in the opinion of the CQA Monitor, will affect performance of the pipe.

E. Replace material found to be defective before or after laying with sound material.

F. Carefully lower pipe and accessories into the trench by means of derrick, ropes, belt slings, or other equipment that will not cause any damage to the pipe.

G. Weld joints prior to placing the polyethylene pipe, except as noted.

H. Under no circumstances drop or dump material into the trench.

I. Rest the full length of each section of pipe solidly upon pipe bedding.

J. Take up or relay pipe that has had the grade disturbed while laying.

K. Use pipe supports and clamps to attach pipe to walls and base of vault.

L. Pipe penetrations through vault walls to be within 0.1 ft of design elevations.

3.3 FUSION WELDING PIPE

A. Polyethylene Fusion Qualification: All pipe fusion must be performed by a supplier, or a factory supplied and/or certified fusion operator.

B. Provide for the instruction, testing, and installation training sessions as required to obtain training for welding personnel, including quality control personnel polyethylene fusion machine operation instruction and familiarization with HDPE pipe and fitting fusion as applicable for the project. Only fully trained personnel will be allowed to perform the installation, supervision, or inspection of polyethylene-fusion joints.

C. Training: Provide training by manufacturer/supplier of the pipe materials in proper fusion procedures and techniques.

D. Join the polyethylene pipe by the method of thermal butt or side wall fusion, outlined in ASTM D2657.

E. Perform fusion joining of pipe and fittings in accordance with the procedures established by the pipe manufacturer. Of particular importance is the use of proper interface pressures and heater plate temperatures.

F. Use fusion pressures, temperatures, and cycle times according to pipe manufacturer's recommendations.

G. Do not perform pipe fusion in water or when trench conditions are unsuitable for the work. Keep water out of the trench until joining is completed.

H. Secure open ends of pipe and close valves when work is not in progress, so that no trench water, earth, or other substance will enter the pipe or fittings. Plug or cap or valve pipe ends left for future connections.

I. Clear welding and grade sites, if necessary, to provide enough space for pipe storage and fusion. Keep the site free of rocks, stumps, and debris that could cut, scar, or gouge the pipe.

J. In order to allow the joining operation to continue in adverse weather conditions, a shelter may be required for the joining machine. Particular caution should be exercised to prevent water from entering the I.D. or O.D. of the pipe and from coming in contact with the heater plate.

K. Clean pipe of all shavings and other debris.

END OF SECTION

SECTION 02771

GEOTEXTILES

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Furnishing and installing geotextile separator as a component of the reactor vault.

1.2 RELATED SECTIONS

A. Section 01025 – Measurement and Payment

B. Section 01300 - Submittals

C. Section 02225 – Drainage Gravel

1.3 REFERENCES

A. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

B. ASTM D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.

C. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

D. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile.

E. ASTM D4833 - Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

F. ASTM D4873 - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.

G. ASTM D4884 - Standard Test Method for Strength of Sewn or Thermally Bonded Seams of Geotextiles.

H. ASTM D5261- Standard Test Methods for Measuring Mass Per Unit Area of Geotextiles.

1.4 DEFINITIONS

A. Manufacturer: Responsible for the production of geotextile rolls.

B. Manufacturing Quality Control (MQC): A planned system of inspections that is used to directly monitor and control the manufacture of a material, which is factory originated. MQC is normally performed by the manufacturer of geosynthetic materials and is necessary to ensure minimum (or maximum) specified values in the manufactured product. MQC refers to measures taken by the manufacturer to determine compliance with the requirements of materials and workmanship as stated in certification documents and contract specifications. ref. EPA/600/R-93/182.

C. Manufacturing Quality Assurance (MQA): A planned system of activities that provides assurance that the materials were constructed as specified in the certification documents and contract specifications. MQA includes manufacturing facility inspections, verifications, audits and evaluation of the raw materials (resins and additives) and geosynthetic products to assess the quality of the manufactured materials. MQA refers to measures taken by the MQA organization to determine if the manufacturer is in compliance with the product certification and contract specifications for the project. Ref. EPA/600/R-93-182.

D. Installer: The party responsible for field handling, storing, deploying, repairing, anchoring, and any other aspects of installing the geotextile. The installer is also responsible for transportation of the material to the site.

E. Construction Quality Assurance Consultant (CQAC): The party, independent from the manufacturer or installer, responsible for observing and documenting activities related to the quality assurance of the production and installation of the geosynthetic components of the geotextile. Also responsible for issuing a construction monitoring report and certification sealed by a Washington State Registered Professional Engineer.

F. Construction Quality Assurance Monitor (CQA Monitor): The CQA site representative, who also represents the OWNER and is responsible for on site implementation of CQA procedures defined by the CQA Manual.

1.5 MANUFACTURER SUBMITTALS FOR REVIEW

A. Submit the following prior to scheduled manufacturing of products for this project.
   1. Manufacturer's description of proposed geotextile documenting it will meet or exceed specified product requirements.
   2. Written instructions for storage, handling, installation, seaming and repair of proposed geotextiles.

B. Submit the following prior to scheduled installation:
   1. Manufacturer's Quality Control (MQC) test results performed on materials manufactured for this project, which documents that the geotextile meets or exceeds minimum average roll values (MARV) specified herein.
   2. Manufacturer's statement that material manufactured for this project is not affected by the chemicals of concern in groundwater.

C. Submit under provisions of Section 01300.

1.6 DELIVERY, STORAGE AND HANDLING

A. Comply with ASTM D4873.

B. Comply with manufacturer's instructions.

C. During shipment and storage, elevate geotextile rolls off the ground and adequately cover to protect them from the following:
   1. Direct sunlight, Ultraviolet light exposure, precipitation, inundation, mud, dirt, dust, puncture, cutting, site construction activities, chemicals that are strong acids or strong bases, flames including welding sparks, temperatures in excess of 140°F (60°C) any other environmental condition that may damage the strength, toughness, and permeability property values of the geotextile.

D. Ship geotextile in closed trailer. Provide straps for unloading geotextile.

E. Immediately restore any damaged protective covering.

PART 2 PRODUCTS

2.1 LABELING

A. Mark or tag geotextile rolls with the following information:
   1. Manufacturer's name.
   2. Product identification.
   3. Lot number.
   4. Roll number.
   5. Roll dimensions.
   6. Mark special handling requirements on rolls.

2.2 GEOTEXTILE SEPARATOR FOR DRAINAGE GRAVEL

A. Products comprised of non-woven, continuous-filament needle punched polypropylene or polyester fabric; staple-filament needle punched yarn oriented into a staple network that maintains its structure during handling, placement, and long-term service.

B. The product cannot be heat burnished.

C. Resistant to soil chemicals.

D. New product made from virgin materials.

E. Geotextile used for separation conforming to the following minimum average roll value (MARV) property values:

Test	ASTM Test Designation	Minimum MQC Test Frequency	Unit	MARV Requirement
1. Mass/Area	D5261	1/100,000 sf	oz/yd^2	8.0
2. Grab Tensile Strength	D4632	1/100,000 sf	lbs.	220
3. Puncture Strength	D4833	1/100,000 sf	lbs.	120
4. Trapezoidal Tear Strength	D4533	1/100,000 sf	lbs.	95
5. Permittivity	D4491	1/540,000 sf	sec^{-1}	1.5
6. Apparent Opening Size	D4751	1/540,000 sf	mm	<0.180
7. UV Resistance (500 hours)	D4355	Historical Data on Similar Product		70% of strength

2.3 GEOTEXTILE SEPARATOR FOR ZVI PRODUCT INSIDE VAULT

A. Products comprised of non-woven, continuous-filament needle punched polypropylene or polyester fabric; staple-filament needle punched yarn oriented into a staple network that maintains its structure during handling, placement, and long-term service.

B. The product cannot be heat burnished.

C. Resistant to soil chemicals.

D. New product made from virgin materials.

E. Geotextile used to separate drainage material around collector pipes from ZVI product inside chambers of reactor vault, conforming to the following minimum average roll value (MARV) property values:

Test	ASTM Test Designation	Minimum MQC Test Frequency	Unit	MARV Requirement
1. Mass/Area	D5261	1/100,000 sf	oz/yd^2	4.0
2. Grab Tensile Strength	D4632	1/100,000 sf	lbs.	120
3. Puncture Strength	D4833	1/100,000 sf	lbs.	60
4. Trapezoidal Tear Strength	D4533	1/100,000 sf	lbs.	50
5. Permittivity	D4491	1/540,000 sf	sec^{-1}	1.5
6. Apparent Opening Size	D4751	1/540,000 sf	mm	<0.2120
7. UV Resistance (500 hours)	D4355	Historical Data on Similar Product		70% of strength

2.4 MANUFACTURER SOURCE QUALITY CONTROL

A. Perform manufacture's quality control (MQC) tests for geotextile manufactured for this project. Perform tests necessary to verify geotextile meets specified product requirements. Perform each MQC test at a minimum frequencies listed in this Section.

B. Provide the following information with MQC test data:
1. Roll numbers and identification.
2. Results of quality control tests, including a description of test methods used.

C. OWNER will reject rolls for which quality control requirements are not met.

2.5 SEWING EQUIPMENT AND ACCESSORIES

A. Provide equipment that meets the following requirements:
1. Maintained in adequate number in order to avoid delaying work.
2. Supplied by a power source capable of providing constant voltage under a combined-line load.
3. Provided with a protective lining and splash pad large enough to catch spilled fuel under an electric generator, if used on geotextile.

PART 3 EXECUTION

3.1 EXAMINATION

A. Prior to installation of geotextile, examine surface against which material will be placed and verify surface is correctly prepared..

3.2 DEPLOYMENT

A. Follow manufacturer's recommendations, standards, and guidelines.

B. Roll geotextile out in such a manner as to continually keep the geotextile sheet in sufficient tension to prevent folds and wrinkles.

C. Weight geotextile with sandbags or equivalent as ballast during deployment. Leave ballast in place until geotextile is covered with succeeding construction layer.

D. Cut geotextile using manufacturer approved cutter only.

E. Do not entrap in geotextile excessive dust, stones, or moisture that could damage or clog drains or filters or hamper subsequent seaming.

3.3 SEAMS AND OVERLAPS

A. For sewn or heat tacked geotextile seams, overlap geotextile 3 inches minimum prior to seaming.

B. For overlapped seams without sewing or heat tacking, overlap geotextile 12 inches minimum.

C. Ensure that no soil materials are inadvertently inserted into the seams of geotextiles.

D. Sew with polymeric thread having chemical resistance and strength properties equal to or exceeding those of geotextile.

E. For sewing, use a 401 two-thread chain stitch, or equivalent.

3.4 PROTECTION

A. Protect geotextile until covered with other material and limit tensile stresses in the geotextile when placing additional materials.

3.5 REPAIRS

A. Repair holes or tears in geotextiles with a patch from the same geotextile material.

B. Continually sew or heat bonded in place with a minimum seam overlap of 12 inches in all directions.

C. Sew or heat bond the geotextile within one inch of the outside edge of the patch materials.

D. Remove any soil or other material that may have penetrated the torn geotextile.

END OF SECTION

DIVISION 3

CONCRETE

SECTION 03111

TREMIE CONCRETE

Notes to specifier:

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Furnishing and installing concrete below the base of the ZVI Reactor Vault by the tremie method, as indicated on the Construction Drawings, to stabilize the base of the excavation against base heave.

1.2 RELATED SECTIONS

A. Section 01025 – Measurement and Payment

B. Section 01300 – Submittals

C. Section 02221 – Excavation

1.3 SUBMITTALS

A. Provide proposed design mix to Owner for approval a minimum of 2 weeks before scheduled pour.

B. Submit proposed placement methods in the Excavation, Shoring, Water Management and Tremie Concrete Placement Plan.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications – A firm experienced in manufacturing ready-mixed concrete products that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Manufacturer capable of producing volume required so the pour can be completed as a single uninterrupted pour.

C. Schedule a pre-installation conference at the site.

1.5 REFERENCES

A. ASTM C33/C33M – Standard Specification for Concrete Aggregates.

B. ASTM C 94/C 94M – Standard Specification for Ready Mix Concrete.

C. ASTM C 150/C 150M – Standard Specification for Portland Cement.

D. ASTM V 494/C 494M – Standard Specification for Chemical Admixtures for Concrete.

NOTES TO SPECIFIER:

PART 2 PRODUCTS

2.1 CONCRETE

A. WADOT 4000W or equivalent.

B. 6 to 9 inch slump and minimum 20 inch slump flow.

C. Minimum compressive strength of 3,000 psi at 28 days.

2.2 CEMENT

A. Portland cement, ASTM C150, Type I/II supplemented with fly ash, ASTM C618, Class C.

B. Fly ash, use fly ash as needed to reduce the total amount of Portland cement.

2.3 AGGREGATE

A. Normal-weight course aggregate, ASTM C33, 3/8 inch nominal maximum coarse aggregate size.

B. Fine aggregate 45 to 55 percent.

2.4 ADMIXTURES

A. Retarder, as required based on travel time and pour time to ensure whole pour can be completed as one operation.

B. Antiwashout product, at manufacturer recommended dosage for application.

C. Water reducer, high range water reducer to work with antiwashout product to maintain workability.

Notes to specifier:

PART 3 EXECUTION

3.1 QUALITY CONTROL

A. Use adequate numbers of skilled workman who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

3.2 TREMIE EQUIPMENT

A. Contractor shall provide a sufficient number of tremie pipes to complete the pour.

B. The tremie pipe shall be straight pipe of sufficient length to extend from the surface to the ground surface at the base of the excavation.

C. If the tremie pipe is sectional the joints shall be flanged and bolted with rubber gaskets to prevent any water leakage into the pipe.

D. The tremie pipe shall be at least 6-in. inside diameter and the upper end shall be equipped with a suitable funnel to receive the concrete.

E. The tremie pipe must have sufficient mass to be negatively buoyant when empty.

F. The funnel and pipe shall be supported so it can be raised and moved as the work progresses.

G. The bottom end of the tremie pipe shall be closed with a plug or plastic cap before admitting concrete at the start of the pour.

H. A sounding lead shall be used to determine the level of the concrete as the pour proceeds.

3.3 PLACEMENT METHOD

A. Concrete plant shall be selected to ensure a continuous placing operation.

B. Concrete shall be deposited to fill the tremie pipe and then the pipe and funnel shall be carefully raised to force the out the plug and allow the concrete to flow.

C. Keep the bottom end of the tremie pipe under the surface of the concrete continuously throughout the pour.

D. Do not vibrate the concrete.

E. Place the concrete in one continuous pour.

3.4 SURFACE FINISH

A. Apply leveling screed to the finish surface of the tremie concrete after dewatering the excavation, if required to provide level and flat surface, with wood float or better finish, for the construction of the reactor vault.

END OF SECTION

LIVERMORE ASSOCIATES DIVISION 3 SPECIFICATIONS

ATTACHED

LIVERMORE ASSOCIATES DIVISION 5 SPECIFICATIONS

ATTACHED

LIVERMORE ASSOCIATES DIVISION 7 SPECIFICATIONS

ATTACHED

CONSTRUCTION DRAWINGS
FINAL CLEANUP ACTION PHASE I

BSB Diversified Site
Kent, Washington

June 2011

(Provided Under Separate Cover)