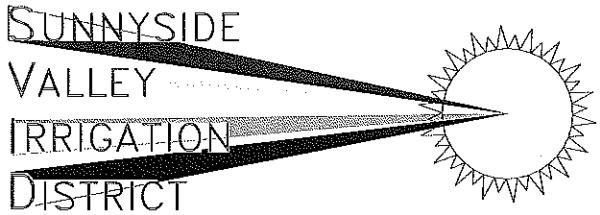
Sunnyside Division Board of Control

Shotcrete/Concrete Bid Package
2010-2011 Construction Season



SERVING AGRICULTURE SINCE 1906

120 S. 11th, SUNNYSIDE, WA 98944 (509)837-6980

Sealed bids will be received until 9:00 am.
January 6, 2011

At

Sunnyside Division Board of Control
120 S. 11th St.
P.O. Box 239
Sunnyside, WA 98944
509-837-6980

Project Contact: Ron Cowin

TABLE OF CONTENTS

Sunnyside Division Board of Control
Shotcrete/Concrete Bid Package
2010-2011 Construction Season

CALL FOR BIDS

Sunnyside Division Board of Control
Shotcrete/Concrete Bid Package
2010-2011 Construction Season

SUNNYSIDE DIVISION BOARD OF CONTROL
120 S. 11th St.
P.O. Box 239
Sunnyside, WA 98944
509-837-6980

Sunnyside Division Board of Control will receive sealed bids until 9:00 a.m., January 6, 2011 at which time they will be opened and publicly read aloud. The bid covers delivery of approximately 498 cubic yards of shotcrete/concrete. Bids will be awarded by total bid. Note: Total price includes sales tax charged at the rate of the city or county which the materials are delivered; sales tax will be calculated using Yakima County sales tax rate of 7.9%.

Contract documents may be obtained from the District, 120 South 11th St. or 1105 Yakima Valley Hwy, PO Box 239, Sunnyside, WA 98944, (509)837-6980. Contract documents may also be obtained from the District website under the *Projects* tab at www.svid.org. Addenda will be e-mailed to bidders who have signed for or requested contract documents through our office. All other bidders will get addenda from the District website. Addenda, if necessary, will be posted no later than January 4, 2011. Questions received after 3:00 p.m. on January 4, 2011, will go unanswered. Bid packages will be mailed if requested through USPS standard mail. Additional charges may apply for express mailing.

A cashiers check or Bidders Bond, payable to Sunnyside Division Board of Control for 5% of the total bid amount must accompany each bid. A signed proposal, Bid Form, Non-Collusion and Debarment Affidavit, Bidder's Qualification Certificate, and Bid Bond Form must also be included with the bid packet along with any addendums.

A performance / payment bond for 25% of awarded bid amount(s) must be submitted after Notice of Award and before Notice to Proceed is issued.

SVID reserves the right to reject any and all bids and to waive irregularities or informalities in the bid or bidding. No bidder may withdraw their bid after the hour set for the bid opening thereof or before award of the contract unless said award is delayed for a period exceeding thirty (30) days.

No alterations to the bid documents will be accepted.

Don Schramm
Sunnyside Valley Irrigation District
Assistant Manager - Engineering

Publish: December 19, 2010
December 26, 2010

Sunnyside Division Board of Control
120 South 11th St.
P.O. Box 239
Sunnyside, WA 98944
(509) 837-6980

PURCHASE AGREEMENT
(Goods and Materials)

Sunnyside Division Board of Control, hereafter referred to as the "SDBOC", agrees to purchase from _____hereafter referred to as "Supplier", the goods and materials, hereafter "goods", set forth on the attached bid form(s) subject to the terms and conditions of this agreement below:

1. The materials to be delivered by the Supplier shall conform to the specifications contained in the SDBOC's shotcrete and concrete mix designs, which are made part of this agreement.

2. The Supplier understands that the SDBOC has estimated a quantity of materials needed, and that the actual amount of materials may be 30% greater or less than the estimated quantity.

3. At the Supplier's expense, the Supplier shall deliver the materials to the 37.10 Reservoir North of Sunnyside and the MB 12.48 Reservoir South of Mabton the two locations are shown on attached map. **Materials are to be delivered from January 3, 2011 to March 31, 2011, Monday through Friday (excluding holidays). The District will provide a 24-hour notice requesting delivery of materials. At that time, location, delivery amount, and delivery time will be available.**

4. After acceptance of delivery of materials by the SDBOC, the Supplier shall provide the SDBOC with an invoice setting forth the quantity of goods delivered to the SDBOC, the price per cubic yard, and the total price. All invoices are paid by the SDBOC the 25th day of the month.

5. The Supplier warrants that the materials conform to specifications issued by the SDBOC and are fit for the uses or purposes disclosed by the SDBOC. At the cost of the SDBOC all materials delivered may be tested to check conformity at the time of delivery.

6. In the event any of the materials fail to comply with the specifications of the SDBOC, at its option, the SDBOC may require the Supplier to replace the defective or non-conforming materials with conforming materials.

7. The Supplier shall be responsible for any damages resulting to the SDBOC from any non-conforming or defective materials, including any consequential damages, and the Supplier shall defend and indemnify the district from any claims, damages, litigation, expenses or costs, including fees which the SDBOC may incur as a result of the defective or non-conforming materials.

8. This agreement and the attachments hereto as well as the Requests for Proposals, constitute the entire agreement between the parties. Any amendments to this agreement shall be in writing and signed by both parties. This agreement may not be modified by language contained in the Supplier's invoice, documents of delivery, or title documents.

9. The Supplier may deal with the following named SDBOC employee with regard to the **performance** under this agreement or other employees who may be designated in writing by the SDBOC.
SDBOC Contact: **Ron Cowin**

10. The Supplier may deal with the following named SDBOC employee with regard to **delivery**.
SDBOC Contact: **Dave Bos**

11. In the event either party must bring an action to enforce any of the items or conditions of this agreement, the prevailing party shall be entitled to recovery of all costs of such action, including reasonable attorney fees. For the purposes of this section the term "action" shall include an arbitration hearing.

12. This agreement shall be interpreted and enforced in accordance with the laws of the State of Washington.

DATED this ____ day of January, 2011.

SUNNYSIDE DIVISION BOARD OF CONTROL

By:_____

Title:_____

SUPPLIER

_____

Title:_____

BID BOND

Any singular reference to Bidder, Surety, Owner, or other party shall be considered plural where applicable. BIDDER (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

BID

Bid Due Date:
Project (Brief Description Including Location):

BOND

Bond Number:
Date (Not later than Bid due date):
Penal sum _____ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER	SURETY
_____ (Seal)	_____ (Seal)
Bidder's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature and Title	Signature and Title (Attach Power of Attorney)
Attest: _____	Attest: _____
Signature and Title	Signature and Title

Note: Above addresses are to be used for giving required notice.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Surety's liability.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

3.2. All Bids are rejected by Owner, or

3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

NON-COLLUSION AND DEBARMENT AFFIDAVIT

STATE OF WASHINGTON
COUNTY OF _____

I, the undersigned, an authorized representative of _____
(Firm, Association or Corporation)

being first duly sworn on oath hereby certify that the bid submitted is a genuine and not a sham or collusive bid, or made in the interest or on behalf of any person not therein named; and I further state that the said firm, association or corporation (hereinafter referred to as "Firm") has not directly or indirectly induced or solicited any bidder on the above work or supplies to put in a sham bid, or any other person or corporation to refrain from bidding; and that said Firm, has not in any manner sought by collusion to secure to the Firm, an advantage over other bidder or bidders.

I further certify that, except as noted below, the Firm or any person in a controlling capacity associated therewith or any position involving the administration of federal funds; is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency; has not been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past 3 years; does not have a proposed debarment pending; and has not been indicted, convicted or had a civil judgment rendered against said person or Firm, by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three years.

I further certify that all subcontractors providing work or purchases over $25,000 meet the above conditions. I will document by using this form and the subcontractor signature block below.

Exceptions noted:

Bidder's Signature _____

I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it as the _____ (title) of _____ to be the free and voluntary act of such party of the uses and purposes mentioned in the instrument.

Dated:
Signature of Notary Public

(Seal or stamp) My appointment expires:

Sub Contractor Firm _____
Sub Contractor Signature _____
I certify that I know or have satisfactory evidence that _____ signed this instrument, on oath stated that (he/she) was authorized to execute the instrument and acknowledged it as the _____ (title) of _____ to be the free and voluntary act of such party of the uses and purposes mentioned in the instrument.

Dated:
Signature of Notary Public
(Seal or stamp) My appointment expires:

BIDDER'S QUALIFICATION CERTIFICATE

The undersigned hereby certifies and submits the following qualifications:

1. Name and Address

_____

_____

_____

2. State of Washington Registration Number and expiration _____

3. Number of years in contracting business under present firm name _____

4. Particular types of work performed by your company:

_____

_____

_____

_____

5. List several recent projects performed:

Amount	Type	Owner	Name	Phone

6. Gross amount of contracts now in hand:

_____

7. Bank reference(s):

_____

_____

_____

By (Authorized Signature): _____

Title _____

Sunnyside Division Board of Control
120 S. 11th Street
P.O. Box 239
Sunnyside, WA 98944
509-837-6980

Proposal

TO: **Sunnyside Division Board of Control**
120 S. 11th Street
P.O. Box 239
Sunnyside, WA 98944
509-837-6980

The undersigned hereby certify that _____ ha__ personally read and thoroughly understand the specifications and contract governing the furnishing of materials and the method by which payment will be made for said work hereby propose__ to undertake to supply the materials embraced in this improvement in accordance with said specifications and contract documents, and at the attached schedule of rates and prices.

Note:

1. If the supplier is a co-partnership, so state, giving firm name under which the business is transacted.
2. If the supplier is a corporation, its duly authorized officials must execute this proposal.

_____
(Supplier)

By:_____
(Authorized Officer)

_____
(Address)

_____

Bid Form
Shotcrete/Concrete

Project	Delivered	Specification	Quantity	Unit	Price/cu yd	Tax @ 7.9%	Total Price with tax
SCIP 37.10 Shotcrete	Multiple locations, see attached map	See specs	310	cu yd	_____	_____	_____
SCIP 37.10 concrete	Multiple locations, see attached map	See specs	160	cu yd	_____	_____	_____
SVID MB 12.48 Shotcrete	Multiple locations, see attached map	See specs	28	cu yd	_____	_____	_____
						Total Bid	_____

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: THAT whereas Sunnyside Division Board of Control, Sunnyside, Washington, a municipal corporation has awarded to:

_____

(Contractor)

hereinafter designated as the "Principal" a contract for work items, which contract consists of the Proposal/Agreement, together with the Contract Documents, Specifications, Addenda and Plans, all as hereto attached and made a part hereof, and more particularly described as:

Shotcrete/Condrete For 2010-2011 Construction Season

and whereas said principal is required under the terms of said contract to furnish a bond for the faithful performance of said contract:

NOW, THEREFORE, we the Principal and _____, a corporation, organized and existing under and by virtue of the laws of the State of Washington, and duly authorized to do business in the State of Washington as surety, are firmly bound unto Sunnyside Division Board of Control in the sum of _____ dollars ($_____) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the above bonded principal, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in said contract, and shall faithfully perform all the provisions of such contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made, at the time and in the manner therein specified; and shall pay all laborers, mechanics, subcontractors and materialmen, and all persons who shall supply such person or persons, or subcontractors, with provisions and supplies for the carrying on of such work on his or their parts; and shall indemnify and hold harmless the Owner's Engineer, its officers and agents, from any loss or damage occasioned to any person or property by reason of any carelessness or negligence on the part of said principal, or any subcontractor, in the performance of said contract or any modifications thereof; and shall further indemnify and save harmless Sunnyside Valley Irrigation District, its officers and agents, from any damage or expense by reason of failure of performance as required by said contract, or any modifications thereof, or from defects appearing or developing in the material or workmanship provided or performed under said contract within a period of one year after acceptance thereof by Sunnyside Valley Irrigation District, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect.

And said surety, for value received, hereby further stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any change, extension of time, alternations or additions to the terms of the contract or the work or to the specifications. This Bond is provided pursuant to and shall be construed in accordance with RCW 39.08.

Sunnyside Division Board of Control
120 S. 11th Street
P.O. Box 239
Sunnyside, WA 98944
509-837-6980

NOTICE OF AWARD

TO: _____

FROM: **Sunnyside Division board of Control**
120 S. 11th Street
P.O. Box 239
Sunnyside, WA 98944
509-837-6980

DATE: _____

This Notice is to advise you that the Sunnyside Division Board of Control has accepted your bid for the 2010-2011 Shotcrete/Concrete bid package.

In accordance with the bid documents you have **(10)** working days from the date of this Notice of Award to complete all of the preconditions provided for in the bid documents, including the execution of the purchase agreement.

This is **not** a Notice to Proceed with the performance of the work under the contract. When you have complied with the requirements set forth in the contract documents a Notice to Proceed will be issued to you.

You are required to return an acknowledged copy of this Notice of Award to the Sunnyside Valley Irrigation District.

Sunnyside Division Board of Control

By:_____

Title: _____

Receipt of Notice of Award is hereby acknowledged.

Supplier

Date:_____ By:_____

Title:_____

Sunnyside Division Board of Control
120 S. 11th Street
P.O. Box 239
Sunnyside, WA 98944
509-837-6980

NOTICE TO PROCEED

TO: _____

FROM: **Sunnyside Division Board of Control**
120 S. 11th Street
P.O. Box 239
Sunnyside, WA 98944
509-837-6980

DATE: _____

In accordance with the contract, which you entered into with the Sunnyside Valley Irrigation District, this is your **Notice to Proceed** with your work in accordance with the contract documents. As provided in the contract documents the District will notify you as to time and location of delivery.

Sunnyside Division Board of Control

By:_____

Date:_____

Donald Schramm
Title: Assistant Manager, Engineering

CAST-IN-PLACE CONCRETE AND SHOTCRETE

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American Concrete Institute (ACI):
   a. 117, Standard Specification for Tolerances for Concrete Construction and Materials.
   b. 211.1, Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
   c. 301, Standard Specification for Structural Concrete.
   d. 302.1R, Guide For Concrete Floor and Slab Construction.
   e. 304R, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
   f. 304.2R, Placing Concrete by Pumping Methods.
   g. 305R, Hot Weather Concreting.
   h. 306.1, Standard Specification for Cold Weather Concreting.
   i. 309R, Guide for Consolidation of Concrete.
   j. 318/318R, Building Code Requirements for Structural Concrete.
   k. SP-15, Standard Specification for Structural Concrete.
2. ASTM International (ASTM):
   a. C31, Standard Practice for Making and Curing Concrete Test Specimens in the Field.
   b. C33, Standard Specification for Concrete Aggregates.
   c. C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
   d. C88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
   e. C94, Standard Specification for Ready-Mixed Concrete.
   f. C143, Standard Test Method for Slump of Hydraulic-Cement Concrete.
   g. C150, Standard Specification for Portland Cement.
   h. C157, Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
   i. C192, Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.
   j. C231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
   k. C260, Standard Specification for Air-Entraining Admixtures for Concrete.
   l. C311, Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete.
   m. C452, Standard Test Method for Potential Expansion of Portland-Cement Mortars Exposed to Sulfate.
   n. C494, Standard Specification for Chemical Admixtures for Concrete.
   o. C595, Standard Specification for Blended Hydraulic Cements.
   p. C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
   q. C1012, Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution.
   r. C1018, Standard Test Method for Flexural Toughness and First-

Crack Strength of Fiber-Reinforced Concrete (Using Beam with Third-Point Loading).

s. C1116, Standard Specification for Fiber-Reinforced Concrete and Shotcrete
t. C1218 Standard Test Method for Water-Soluble Chloride in Mortar and Concrete
u. C1240, Standard Specification for Silica Fume for Use as a Mineral Admixture in Hydraulic-Cement Concrete, Mortar, and Grout.
v. D2000, Standard Classification System for Rubber Products in Automotive Applications.
w. D4580, Standard Practice for Measuring Delaminations in Concrete Bridge Decks by Sounding.
x. E329, Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

3. National Bureau of Standards: Handbook No. 44, Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measuring Devices.

1.02 DEFINITIONS

A. Defective Areas: Surface defects that include honeycomb, rock pockets, indentations greater than 3/16 inch, cracks 0.005 inch wide and larger as well as any crack that leaks for liquid containment basins and belowgrade habitable spaces; cracks 0.010 inch wide and larger in nonfluid holding structures spalls, chips, air bubbles greater than 3/4 inch in diameter, pinholes, bug holes, embedded debris, lift lines, sand lines, bleed lines, leakage from form joints, fins and other projections, form popouts, texture irregularities, and stains and other color variations that cannot be removed by cleaning.

B. Exposed Concrete: Concrete surfaces that can be seen inside or outside of structures regardless whether concrete is above water, dry at all times, or can be seen when structure is drained.

C. Hydraulic Structures: Liquid containment basins.

D. New Concrete: Less than 60 days old.

E. Slurry Concrete: Mixture of sand, 3/8-inch minus aggregate, cement, and water for wall construction joints.

F. Concrete Fill: Secondary concrete where shown on Drawings.

1.03 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
   a. Product Data: Admixtures, bonding agent, bond breaker, and patching materials.
   b. Design Data: Concrete mix designs signed by qualified mix designer.
   c. Placement Drawings: Concrete, identifying location of each type of construction joint.
   d. Gradation for coarse and fine aggregates, and combined together. List gradings, percent passing through each sieve size.
   e. Detailed plan for cold weather curing and protection of concrete placed and cured in weather below 40 degrees F.
   f. Detailed plan for hot weather placements including curing and

protection for concrete placed in ambient temperatures over 80 degrees F.
g. Concrete repair methods and materials.
h. Fiber reinforcement.

B. Informational Submittals:

1. Manufacturer's application instructions for bonding agent and bond breaker.
2. Manufacturers' Certificate of Compliance:
   a. Portland cement.
   b. Admixtures.
   c. Fly ash.
   d. Aggregates.
   e. Bonding agent.
   f. Patching materials.
   g. Admixtures: Manufacturers' Certificate of Proper Installation.
   Certificates:
3. Statements of Qualification:
   a. Mix designer.
   b. Batch plant.
4. Test Reports:
   a. Admixtures, test reports showing chemical ingredients and percentage of chloride in each admixture and fly ash.
   b. Source test analysis report for fly ash, including percentage of chloride content.
   c. Statement identifying aggregates reactivity. Determine water soluble chloride in each component of aggregates in accordance with ASTM C1218.
   d. For each trial concrete mix design and signed by a qualified mix designer.
   e. Cylinder compressive test results for laboratory concrete mixes.
5. Concrete Delivery Tickets:
   a. For each batch of concrete before unloading at Site.
   b. Record of drum revolution counter, type, brand, test certification, Amount of fly ash if used in accordance with ASTM C94, Section 16.

1.04 QUALITY ASSURANCE

A. Qualifications:
   1. Mix Designer: Licensed professional engineer registered in the State of Project or state DOT approved mix designer in the State of Project.
   2. Batch Plant: Demonstrate competency in similar projects within last 5 years.

PART 2 PRODUCTS

2.01 MATERIALS

A. Cement: Furnish from one source.

1. Portland Cement Type I or Type II:
   a. Meet ASTM C150.
   b. Alkalies: Maximum 0.60 percent.
   c. Tricalcium Aluminate Content of Type I Cement: Maximum 12 percent.
   d. Nonhydraulic Abovegrade Structures: Type I or Type II cement.
   e. Hydraulic and Belowgrade Structures and Sewers: Type II cement or

combination of Type I mixed with fly ash or granulated blast furnace slag or a combination of both.

f. Combine fly ash with cement at batch plant or during production of cement in accordance with ASTM C595, Type IP cement.

2. Blended hydraulic cement shall be either Type IP or Type IS) cement conforming to AASHTO M 240 or ASTM C-595, except that the blended hydraulic cement shall not contain more than 0.75-percent alkalis by weight calculated as Na20 plus 0.658 K20 and the content of Tricalcium aluminate (C3A) shall not exceed 8-percent by weight calculated as 2.650A1203 minus 1.692Fe203 and meet the following additional requirements:
   a. Type IP(X), Portland Pozzolan Cement, where (X) dictates pozzolan percentage. Type IP (X), Portland Pozzolan Cement, shall be Portland cement and Pozzolan and the pozzolan shall be limited to fly ash or ground granulated blast furnace slag. Fly ash is limited to a maximum of 35-percent by weight of the cementitious material. Ground granulated blast furnace slag is limited to a maximum of 40-percent by weight of the cementitious material.
   b. Type IS(X), Portland Blast Furnace Slag Cement, where (X) dictates slag percentage. Type IS(X), Portland Slag Cement, shall be Portland Cement and ground granulated blast furnace slag. The addition of ground granulated blast furnace slag shall be limited to a maximum of 40-percent by weight of the cementitious material.
   c. The source and weight of the fly ash or ground granulated blast furnace slag shall be certified on the cement mill test certificate and shall be reported as a percent by weight of the total cementitious material. The fly ash or ground granulated blast furnace slag constituent content in the finished cement will not vary morethan plus or minus 5 percent by weight of the finished cement from the certified value.

A. Aggregates: Furnish from one source.

1. Natural Aggregates:
   a. Free from deleterious coatings and substances in accordance with ASTM C33, except as modified herein.
   b. Free of materials and aggregate types causing popouts, discoloration, staining, or other defects on surface of concrete.
2. Nonpotentially Reactive: In accordance with ASTM C33, Appendix XI, Paragraph X1.1.
3. Aggregate Soundness: Test for fine and coarse aggregates in accordance with ASTM C33 and ASTM C88 using sodium sulfate solution.
4. Fine Aggregates:
   a. Clean, sharp, natural sand.
   b. ASTM C33.
   c. Materials Passing 200 Sieve: 4 percent maximum.
   d. Limit deleterious substances in accordance with ASTM C33, Table 1 with material finer than 200 sieve limited to 3 percent, coal and lignite limited to 0.5 percent.
5. Coarse Aggregate:
   a. Natural gravels, combination of gravels and crushed gravels, crushed stone, or combination of these materials containing no more than 15 percent flat or elongated particles (long dimension more than five times the short dimension).
   b. Materials Passing 200 Sieve: 0.5 percent maximum.
   c. Limit deleterious substances in accordance with ASTM C33, Table 3 for exposed concrete.

B. Admixtures: Furnish from one manufacturer.

1. Characteristics: Compatible with each other and free of chlorides or other corrosive chemicals.
2. Air-Entraining Admixture:
    a. ASTM C260, nontoxic after 30 days and contains no chlorides.
    b. Concrete with air-entrainment admixture added shall maintain air percentage as batched, within plus or minus 2 percent for time required for placement into structure.
3. Water-Reducing Admixture: ASTM C494, Type A or Type D.
    a. Manufacturers and Products:
        1. Master Builders, Inc., Cleveland, OH; Pozzolith or Polyheed.
        2. W. R. Grace & Co., Cambridge, MA; WRDA with HYCOL.
        3. Euclid Chemical Co., Cleveland, OH; Eucon WR-91.
4. High Range Water Reducing Admixture (Superplasticizer):
    a. ASTM C494.
    b. Hold slump of 5 inches or greater for time required for placement.
    c. Furnish type as recommended by manufacturer for allowed temperature ranges.
    d. Type F or G.
    e. Manufacturers and Products:
        1. Master Builders, Inc., Cleveland, OH; Rheobuild or Polyheed at dosage greater than 10 ounces per 100 pounds of cement.
        2. W. R. Grace & Co., Cambridge, MA; Daracem 100.
        3. Euclid Chemical Co., Cleveland, OH; Eucon 537.
5. Fiber Reinforcing (Micro-Fibers):
    a. 100 percent virgin polypropylene self-fibrillating fibers.
    b. Multidesign gradation.
    c. Fibrillated bundles to allow uniform distributed angular fibrils (fiber strands) when mixed into concrete.
    d. Specific Gravity: 0.91 minimum.
    e. Reprocessed olefin materials are not allowed.
    f. Type III fibers conforming to ASTM C1116, Part 4.1.3.
    g. Fiber Length: 0.50 inch to 1.0 inch.
    h. Manufacturers and Products:
        1. Polypropylene Fibers: SI concrete Systems, Chattanooga, TN; Enduro 600.
        2. Synthetic Fibers: SI concrete Systems, Chattanooga, TN; Fibermesh 300.
        3. Blended Fibers: SI concrete Systems, Chattanooga, TN; Novomesh 850.
        4. Grace Construction Products: Cambridge, MA; Grace MicroFiber
6. Pozzolan (Fly Ash): Class C or Class F fly ash in accordance with ASTM C618, Table 1 and 2, except as modified herein:
    a. Shall not be produced from process that has utilized hazardous or potentially hazardous materials.
    b. Loss on Ignition: Maximum 3 percent.
    c. Water Requirement: Maximum 100 percent of control.
    d. ASTM C618, Table 1A shall apply when aggregate or portion of coarse or fine aggregate used is reactive as specified under Paragraph Nonpotentially Reactive.
    e. ASTM C618, Table 2A, Reactivity with Cement Alkalies, apply when aggregate or portions of aggregate is reactive as specified under Paragraph Nonpotentially Reactive.

f. ASTM C618, Table 2A, Uniformity Requirements, apply when loss on ignition of fly ash furnished exceeds 3 percent.

7. Fly Ash: Maximum 25 percent, minimum 15 percent of total weight of fly ash plus cement.
8. For fly ash not meeting requirements of chemical ratio listed above, furnish the following:
    a. Test fly ash in accordance with ASTM C1012.
    b. Furnish test data confirming fly ash in combination with cement used meets strength requirements, is compatible with air-entraining agents and other additives, and provides increased sulfate resistance equivalent to or better than Type II cement.
    c. Conduct tests using proposed fly ash and cement samples together with control samples using Type II cement without fly ash.
9. Ground granulated blast furnace slag shall meet the requirements of AASHTO M 302, Grade 100 or Grade 120. The grade of the ground granulated blast furnace slag, the source, and type of manufacturing facility shall be certified on the cement milltest certificate.

A. Water: Clean and potable containing less than 500 ppm of chlorides.

2.02 ANCILLARY MATERIALS

A. Bonding Agent:

1. Furnish two-component epoxy.
2. Consult manufacturer for surface finish, pot life, set time, vertical or horizontal application, and forming restrictions.
3. Manufacturers and Products:
    a. Chemrex, Inc., Shakopee, MN; Concresive.
    b. Sika Chemical Corp., Lyndhurst, NJ; Sikadur 32.
    c. Euclid Chemical Co., Cleveland, OH; Euco Epoxy System.
    d. Contech Services, Inc., Seattle, WA.

B. Bond Breaker:

1. Nonstaining type, providing positive bond prevention.
2. Manufacturers and Products:
    a. Williams Distributors, Inc., Seattle, WA; Williams Tilt-Up Compound.
    b. SCA Construction Supply Div., Superior Concrete Accessories, Franklin Park, IL; Silcoseal 77.
    c. Burke Co., San Mateo, CA; Burke Clean Lift Bond Breaker or Burke Tilt Free Bond Breaker.

C. C. Repair Material: As approved by Engineer.

2.03 CONCRETE AND SHOTCRETE MIX DESIGN

A. Design: Select and proportion ingredients using trial batches; sample, cure and test concrete mix through approved independent testing laboratory in accordance with ACI 211.1.

1. Concrete and Shotcrete Compressive Strength, F'c:
    a. 4,000 psi at 28 days, unless otherwise shown.
    b. Design lab-cured trial mix cylinders.
    c. Use additional cement or cement plus fly ash above minimum specified

if required to meet average compressive strength, F'cr.

d. Use F'cr as basis for selection of concrete proportions as set forth in ACI 301.
e. F'cr: Equal to F'c plus 1,200 when data are not Minimum Cement Content (or Combined Cement Plus Fly Ash Content When Fly Ash is Used):

B. Proportions:

1. Design mix to meet aesthetic and structural concrete requirements.
2. In accordance with ACI 211.1, unless specified otherwise.
3. Unless specifically stated otherwise, water-cement ratio (or water-cement plus fly ash ratio) shall control amount of total water added to concrete as follows:

Water-Cement Ratio		
Coarse Aggregate Size	**Maximum W/C Ratio w/ Superplasticizer**	**Maximum W/C Ratio w/o Superplasticizer**
1-1/2"	0.40	0.44
1"	0.40	0.44
3/4"	0.40	0.44
3/8"	0.40	0.44

4. Minimum Cement Content (or Combined Cement Plus Fly Ash Content When Fly Ash is Used):
    a. 517 pounds per cubic yard for concrete with 1-1/2-inch maximum size aggregate.
    b. 540 pounds per cubic yard for 1-inch maximum size aggregate.
    c. 564 pounds per cubic yard for 3/4-inch maximum size aggregate.
    d. Increase cement content or combined cement plus fly ash content, as required to meet strength requirements and water-cement ratio.

C. Admixtures:

1. Air Content: 4 to 6 percent when tested in accordance with ASTM C231; 3 percent maximum for interior slabs where steel floor finish is required.
2. Fly Ash: Maximum 25 percent, minimum 15 percent of total weight of fly ash plus cement.
3. Water Reducers: Use in all concrete.
4. High Range Water Reducers (Superplastizicers): Use at Contractor's option. Control slump and workability to at least 4-1/2-inch slump at discharge into forms by adjusting high range water reducer at batch plant.
5. Fiber Reinforcing:
    a. Add 1.5 pounds minimum per cubic yard at the time concrete and shotcrete is batched.
    b. Mix fibers into concrete and shotcrete in accordance with fiber manufacturer's instructions.

D. Slump Range at Site:

1. 4-1/2 inches minimum, 8 inches maximum for concrete with a high range water reducing admixture.
2. 3 inches minimum and 5 inches maximum for concrete without high range water reducing admixture.

E. Combined Aggregate Gradation:
1. For Concrete: Select one of the following gradations 1-1/2", 1", 3/4" shown in the following table.
2. For Shotcrete use the 3/8" gradation shown in the following table.
3. Combined Gradation Limits: Limits shown are for coarse aggregates and fine aggregates mixed together (combined).

Sieve Sizes	Combined Gradation			
	Percentage Passing			
	1-1/2" Max.	1" Max.	3/4" Max.	3/8" Max.
2"	- 100	-	-	-
1-1/2"	95 - 100	100	-	-
1"	65 - 85	90 - 100	- 100	-
3/4"	55 - 75	70 - 90	92 – 100	-
1/2"	-		68 – 86	-
3/8"	40 - 55	45 - 65	57 – 74	-100
No. 4	30 - 45	31 - 47	38 – 57	95-100
No. 8	23 - 38	23 - 40	28 – 46	68-86
No. 16	16 - 30	17 - 35	20 – 36	47-65
No. 30	10 - 20	10 - 23	14 – 25	27-42
No. 50	4 - 10	2 - 10	5 – 14	9-20
No. 100	0 - 3	0 - 3	0 – 5	0-7
No. 200	0 - 2	0 - 2	0 – 2	0-2.5

2.04 CONCRETE MIXING

A. General: In accordance with ACI 304R.

B. Concrete Mix Temperatures: As shown below for various stages of mixing and placing:

Concrete Temperatures				
	Concrete Member Size, Minimum Dimension			
Ambient Air Temp.	**<12"**	**12"-36"**	**36"-72"**	**>72"**
Minimum concrete temperature as mixed for indicated air temperature:				
Above 30 deg .F	60 deg. F	55 deg. F	50 deg. F	45 deg. F
0 to 30 deg. F	65 deg. F	60 deg. F	55 deg. F	50 deg. F
Below 0 deg. F	70 deg. F	65 deg. F	60 deg. F	55 deg. F
Maximum allowable gradual temperature drop in first 24 hours after curing period and after end of protection:				
–	50 deg. F	40 deg. F	30 deg. F	20 deg. F

C. Truck Mixers:

1. Equip with electrically actuated counters to readily verify number of revolutions of drum or blades.
2. Counter:
    a. Resettable, recording type, mounted in driver's cab.
    b. Actuated at time of starting mixers at mixing speeds.
3. Truck mixer operation shall furnish concrete batch as discharged that is homogeneous with respect to consistency, mix, and grading.
4. If slump tests taken at approximately 1/4 and 3/4 points of load during discharge give slumps differing by more than 2 inches when specified, slump is more than 4 inches, discontinue use of truck mixer unless causing condition is corrected and satisfactory performance is verified by additional slump tests.
5. Before attempting to reuse unit, check mechanical details of mixer, such as water measuring, and discharge apparatus, condition of blades, speed of rotation, general mechanical condition of unit, admixture dispensing equipment, and clearance of drum.
6. Do not use nonagitating or combination truck and trailer equipment for transporting ready-mixed concrete.
7. Concrete Volume in Truck:
    a. Limit to 63 percent of total volume capacity in accordance with ASTM C94 when truck mixed.
    b. Limit to 80 percent of total volume capacity when central mixed.
8. Mix each batch of concrete in truck mixer for minimum 70 revolutions of drum or blades at rate of rotation designated by equipment manufacturer.
9. Perform additional mixing, if required, at speed designated by equipment manufacturer as agitating speed.
10. Place materials, including mixing water, in mixer drum before actuating revolution counter for determining number of mixing revolutions.

D. Aggregates: Thoroughly and uniformly wash before use.

E. Admixtures:

1. Air-Entraining Admixture: Add at plant through manufacturer-approved dispensing equipment.
2. Water Reducers: Add prior to addition of high range water reducing admixture (superplasticizers).
3. High range water reducing admixture (superplasticizers) and Air-Entraining Admixtures:
    a. Add at concrete plant only through equipment furnished or approved by admixture manufacturer.
    b. Accomplish variations in slump, working time, and air content for flowable mixes by increasing or reducing high range water reducing admixture (superplasticizers) dose or air-entraining admixture dose at ready-mix plant only.
    c. Equipment shall provide for easy and quick visual verification of admixture amount used for each dose.
    d. Add discharge amount to each load of concrete into separate dispensing container, verify amount is correct, and add to concrete.
    e. Additional dosage of high range water reducing admixture (superplasticizers) may be added in field using manufacturer-approved dispensing when unexpected delays cause too great of slump loss.

2.05 SOURCE QUALITY CONTROL

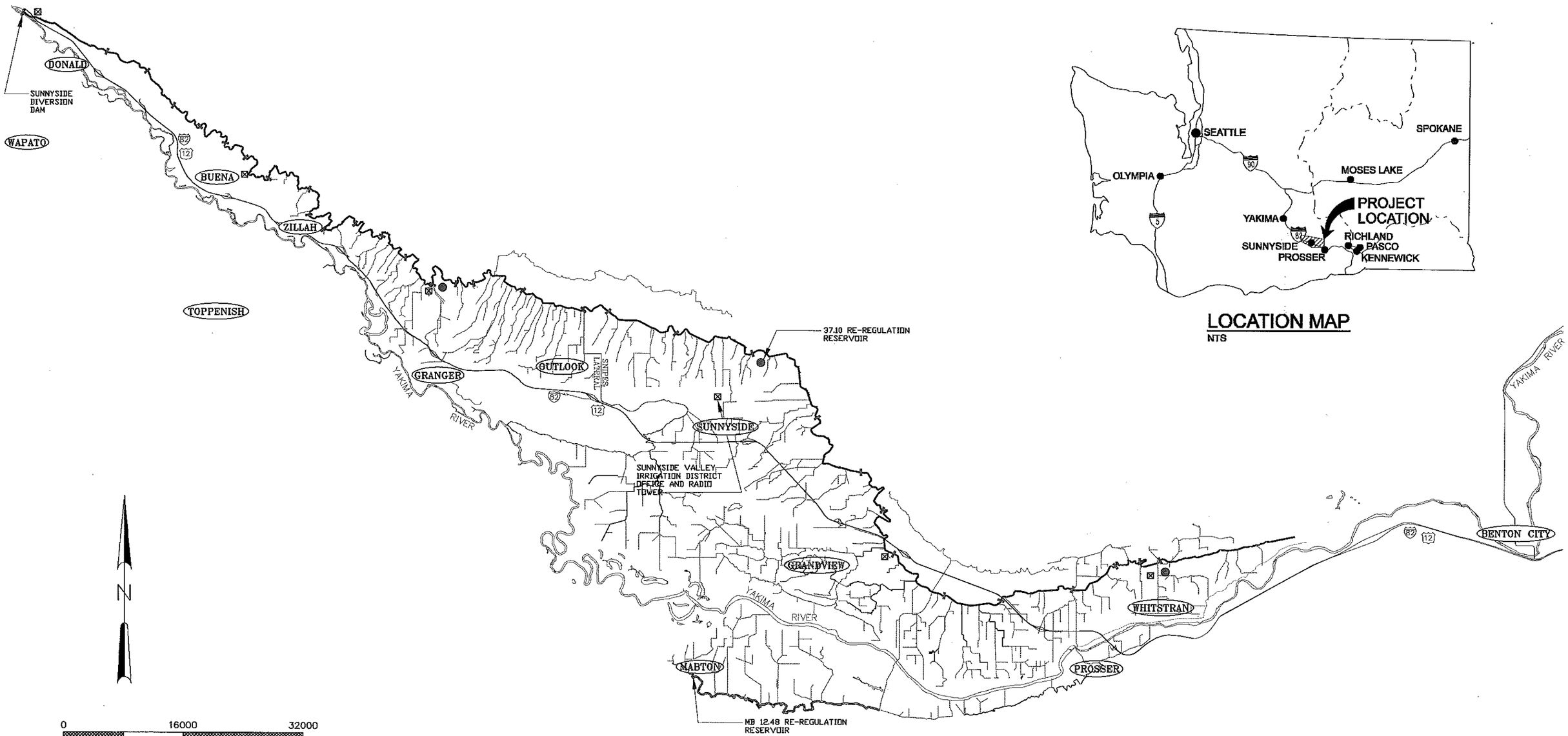
A. Cement: Test for total chloride content.

B. Fly Ash: Test in accordance with ASTM C311.

C. Batch Plant Inspection: Engineer shall have access to and have right to inspect batch plants, cement mills, and supply facilities of suppliers, manufacturers, and Subcontractors, providing products included in these Specifications.

1. Weighing Scales: Tested and certified within tolerances set forth in the National Bureau of Standards Handbook No. 44.
2. Batch Plant Equipment: Either semiautomatic or fully automatic in accordance with ASTM C94.

PART 3 EXECUTION (NOT USED)



LOCATION MAP
NTS

SUNNYSIDE VALLEY IRRIGATION DISTRICT	SHOTCRETE DELIVERY LOCATIONS	DATE: 11/19/10	DRAWN BY: DL
SUNNYSIDE, WASHINGTON 98944		SCALE: 1"=16000'	APPROVED BY: DS